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Vol. II No. 1

July 1984

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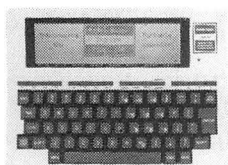
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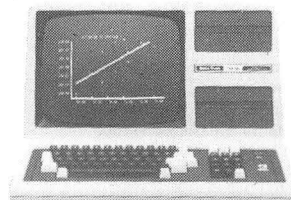
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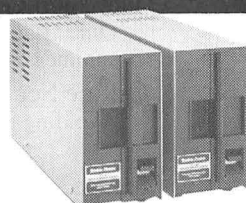
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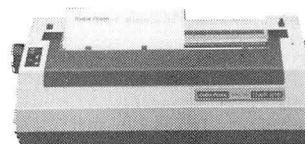
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Thanks for 'Year One'

What an exciting issue — PCM's First Anniversary. And, you will note, we're growing, adding new features and, we believe, improving all the time. For those of you who have been with us since the beginning, thank you. (You should have just received your renewal notices!) For those of you who have joined us during the year, thank you, too. *We do* appreciate your support.

It would be a little too much for us to pat ourselves on the back for all the things we have done in this last year. And, it wouldn't be good form, either. But, candidly, I think PCM has grown to become a significant force in the marketplace and, with our new emphasis, I do believe we are the *one* magazine that will apply to your needs for either the TRS-80 Portable Computer or the Tandy 2000.

Someone called in the other day to do an interview for a trade publication and asked me what I thought was the most significant thing that had happened in connection with PCM in its first year of life. I think the reporter was fishing for something relating to the bar codes which we publish on a regular basis — but that wasn't the answer he got. What he did get was, perhaps, a little surprising to him and (poor guy) he got a little "lecture" as well.

I told him that the most significant thing that had happened with PCM was that we didn't miss a single issue and that, within a few days, we met our

deadlines every month so that you got your magazines about the same time for each issue (Postal Service problems excepted).

As I say, he was a little taken aback. After all, publications are *supposed* to meet deadlines and not skip issues. But, what seems to amaze me is that, at least in the computer field, a number of magazines seem to come out willy-nilly with little attention to deadlines and the like.

That doesn't do you any good, I think. When you commit to a particular publication — either by subscribing or planning to buy at a store — you *expect* to see the publication at a certain time. I know I do. And, for those publications which I use, I sort of allot time to use them between issues. If one comes right on the heels of another or if there is six or seven weeks between, it messes up my plans. *We* try not to do that to you. I wish everybody did the same.

In the coming months, you will see an increase in services offered by PCM. Some of these are still in the planning stages while others are more firm. As they come to pass, we will announce them with appropriate fanfare. We do hope that you will be pleased.

One thing that I have been pleased about is an area for which I can only say "thank you" to a number of you. Just recently, I mentioned that you could really help us by mentioning our name when you bought or inquired about a product for your Portable Computer or Tandy 2000. In the last couple of weeks,

we have received a number of letters and comments from our advertisers that many of you are doing just that. It really helps us because it proves to an advertiser that he or she is spending his money in the right place. Thanks to you who have been helping us.

Obviously, the more help we get means the more advertising we get. And, the more ads there are, the more pages of editorial material we can publish. That means more programs, more tutorials and, generally, more of everything for you. It's a two-way street. As I said, "thanks."

And, while saying thanks, it would be highly inappropriate if I closed this First Anniversary Issue column without mentioning the names of many of the people who have helped us in the past year. We've done some interesting and unique things, and most of that has been because of people helping us.

So, my appreciation to Robert Frowenfeld, Dick White, Danny Humphress, Vince Lord, Jim Hawk, Dan Downard, Dick Redman, Jack Torres, Mark Yamagata, Ed Juge, Bob Rosen, Larry Preble, Mike Himowitz, Randy Graham, Terry Haas, Lisa Grella, Russell Roberts, Sam Redman, Bill Nolan . . . and, certainly not the least, all the staff here for a job well done!

We've enjoyed Year One and look forward to continuing to serve you in Year Two.

— Lonnie Falk

A Graph Is Worth A Thousand Digits

By Robert Frowenfeld
PCM Contributing Editor



They say a picture is worth a thousand words. If you're one who uses computers to help you with your business (and why else would you be reading PCM?!) then you can certainly appreciate the benefit of charts and graphs. Looking over a column of figures can get pretty boring (not to mention confusing), and I've always found it useful to have a few programs at my fingertips that help relieve the tiresome task of trying to make sense out of a bunch of numbers.

This month's "On The Road" is going to help you, the enterprising entrepreneur, by gently guiding you into the world of computer graphics! As you may know, the Model 100's liquid crystal display (LCD) is made up of many little dots, 240x64 to be exact. By turning these dots (or pixels) on or off, lines, boxes, even circles can be drawn. In the two programs I have conjured up for this month's column, you can plot two different types of bar graphs. Each is designed to allow you to plot a set of items for up to 12 months at a time. The first program, which I call *BARGRP.BA*, plots two sets of numbers; I call the second program *BARGR3.BA* because it can display up to three sets of values at one time.

Input for these programs is provided via a data file which you create with the Model 100's trusty text editor, *TEXT*. Unlike our usual "On The Road" programs, this time you get to name the files yourself; you can name them anything you want. Just be sure to follow a few simple rules when selecting a file

name. First, make sure it is a valid name. I suggest looking at the Model 100's instruction manual if you have any doubts. Generally, I make the first character a letter and use letters and numbers to make up the remaining characters of the file name. While there are some special characters that can be used, such as a hyphen, I stick to my format since it is standard in all forms of Microsoft BASIC. Also, when naming a file, have it make some sense to you. There's no reason to name your sales data file *XYZ.DO* when it's just as easy to name it *SALES.DO* (remember all Model 100 text files have the extension '.DO'). As you can see by the sample input files in the illustrations, the first two lines of text are the main heading and subheading. When entering the subheading, try to keep it relatively short (as in the example) since the legend will be printed to the right of it. The next line of data is for inputting the minimum and maximum values for the Y-axis. Since there is space for only three digits here, you must keep the maximum value below 1,000.

Now comes the raw data. It can be sales, income, the height of your grandson, etc. Just enter the 12 values for each of the 12 months, separating each value with a comma, as shown. If you are running *BARGRP.BA*, then you will have two lines of input here. If you're running *BARGR3.BA*, you'll need three.

After the data comes the legend. Because of the space restrictions, I was forced to place the legend next to the

(Robert Frowenfeld owns his own computer programming firm in Louisville, Ky., and has completed his graduate course work in computer science at the University of Louisville.)

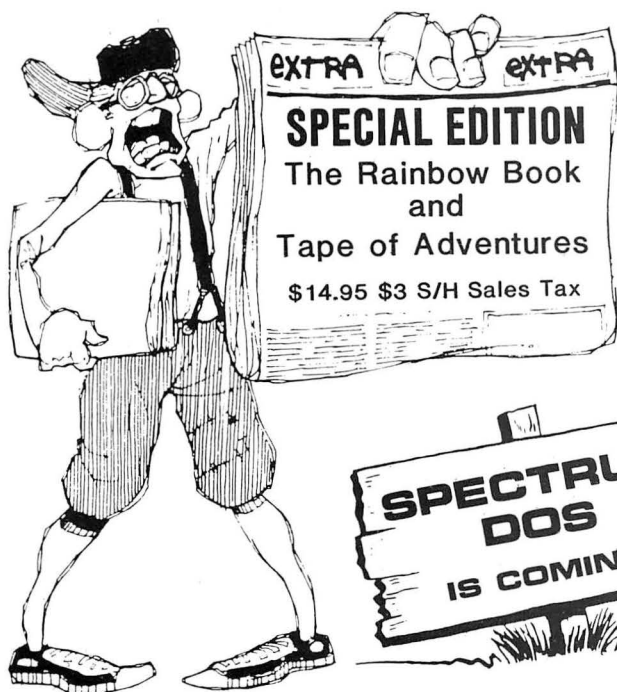
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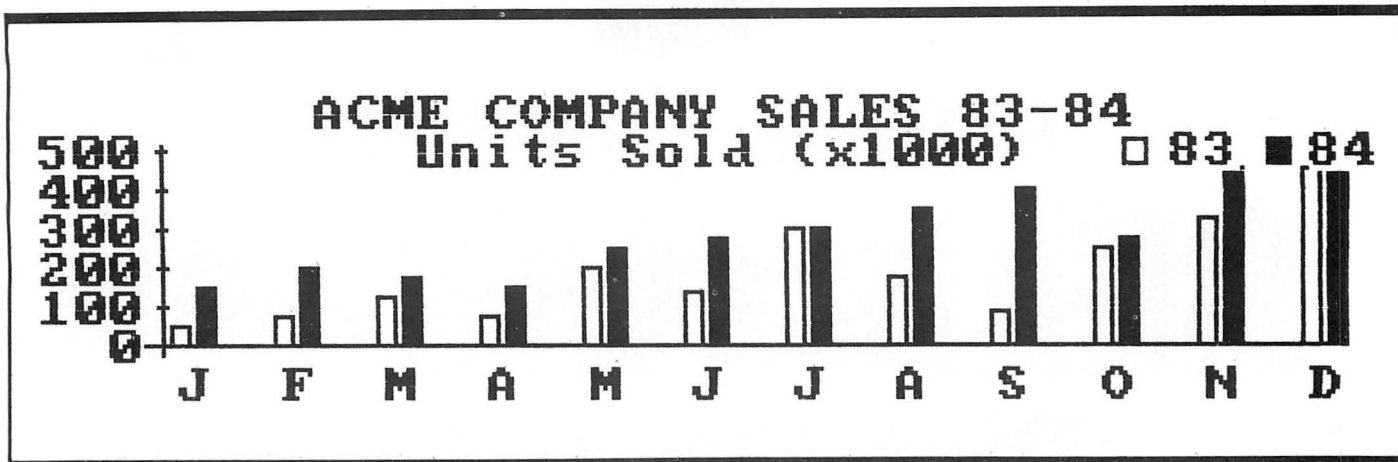
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subtitle and, in doing so, I had to limit the length of the legend to two characters. Since each bar could be used to represent a different year, I have coded the legends with the last two digits of each year, i.e., 82,83,84. You could, if you wanted to, plot three products for the same year. For example, if you were plotting your inventories of watches, widgets, and wiper blades, you could

encode them as WA, WI and WB. Another idea might be to plot the relative contribution of three products to each month's total sales. To do this, you would set your minimum and maximum values to 0 and 100, and your data would reflect the percentage of each item relative to the total. In all, if you give it a little thought, you can use these programs to plot just about anything

you want.

A final note: Once the bar chart is displayed, you can call for another one just by pressing the ENTER key. If you press the 'M' key instead, you will be returned to the Model 100's main menu. Similarly, if you type in a file name of "MENU," you will also be exited from BASIC and returned to the main menu. Until next month, happy plotting!

Sample Input File For *BARGRP.BA*

```
ACME COMPANY SALES 83-84
Units Sold (x1000)
0,500
50,80,120,70,200,140,300,180,90,250,320,
450
150,200,170,150,250,270,300,350,400,280,
450,500
83
84
```

Sample Input File For *BARGR3.BA*

```
ACME COMPANY SALES 82-84
Units Sold (x1000)
0,750
50,80,120,70,200,140,300,180,90,250,320,
450
150,200,170,150,250,270,300,350,400,280,
450,500
200,120,340,230,150,90,250,400,400,450,4
00,600
82
83
84
```



Listing 1

```
5 R$=CHR$(27)+"p":U$=CHR$(27)+"q
7 M$="JFMAMJJASOND"
10 CLS
12 PRINT @49,R$;" PCM Bar Chart Plotter
";U$;
15 PRINT @170,"File to Plot: ";:LINE INP
```

```
UT FI$
16 IF FI$="MENU" OR FI$="menu" OR FI$="M
enu" THEN MENU
18 OPEN FI$ FOR INPUT AS 1
20 CLS
25 DIM X(12)
27 LINE INPUT #1,T1$:LINE INPUT #1,T2$
30 PRINT @19-LEN(T1$)/2,R$;" ";T1$;" ";U
$;
35 PRINT @59-LEN(T2$)/2,R$;" ";T2$;" ";U
```

```

$;
37 INPUT #1,LO,HI
40 LINE(20,08)-(20,53)
45 LINE(20,51)-(230,51)
50 FOR I=1 TO 12:PRINT @284+3*(I-1),MID$
(M$,I,1);:NEXT I
55 INC=(HI-LO)/5
60 FOR I=0 TO 5:PRINT @240-40*I,USING "#
##";LO+INC*I;:NEXT I
65 FOR I=0 TO 5:LINE(19,51-I*8)-(21,51-I
*8);NEXT I
80 FOR I=1 TO 12:INPUT #1,X(I):X(I)=X(I)
/(10*(HI-LO)/500);NEXT I
90 FOR I=1 TO 12:X1=22+18*(I-1):X2=X1+4:
Y1=51:Y2=51-.8*X(I):LINE(X1,Y1)-(X2,Y2),
1,B:NEXT I
98 FOR I=1 TO 12:INPUT #1,X(I):X(I)=X(I)
/(10*(HI-LO)/500);NEXT I
100 FOR I=1 TO 12:X1=28+18*(I-1):X2=X1+4:
Y1=51:Y2=51-.8*X(I):LINE(X1,Y1)-(X2,Y2),
1,BF:NEXT I
105 LINE INPUT #1,T3$:LINE INPUT #1,T4$
110 PRINT@ 74,LEFT$(T3$,2);
112 PRINT@ 78,LEFT$(T4$,2);
120 LINE(201,14)-(195,09),1,B
130 LINE(225,14)-(219,09),1,BF
150 A$="":A$=INKEY$:IF A$="" THEN 150
160 IF A$="M" OR A$="m" THEN MENU ELSE R
UN

```

```

20 CLS
25 DIM X(12)
27 LINE INPUT #1,T1$:LINE INPUT #1,T2$
30 PRINT @19-LEN(T1$)/2,R$;" ";T1$;" ";U
$;
35 PRINT @59-LEN(T2$)/2,R$;" ";T2$;" ";U
$;
37 INPUT #1,LO,HI
40 LINE(20,08)-(20,53)
45 LINE(20,51)-(230,51)
50 FOR I=1 TO 12:PRINT @284+3*(I-1),MID$
(M$,I,1);:NEXT I
55 INC=(HI-LO)/5
60 FOR I=0 TO 5:PRINT @240-40*I,USING "#
##";LO+INC*I;:NEXT I
65 FOR I=0 TO 5:LINE(19,51-I*8)-(21,51-I
*8);NEXT I
80 FOR I=1 TO 12:INPUT #1,X(I):X(I)=X(I)
/(10*(HI-LO)/500);NEXT I
90 FOR I=1 TO 12:X1=22+18*(I-1):X2=X1+2:
Y1=51:Y2=51-.8*X(I):LINE(X1,Y1)-(X2,Y2),
1,B:NEXT I
98 FOR I=1 TO 12:INPUT #1,X(I):X(I)=X(I)
/(10*(HI-LO)/500);NEXT I
100 FOR I=1 TO 12:X1=26+18*(I-1):X2=X1+2:
Y1=51:Y2=51-.8*X(I):LINE(X1,Y1)-(X2,Y2),
1,BF:NEXT I
101 FOR I=1 TO 12:INPUT #1,X(I):X(I)=X(I)
/(10*(HI-LO)/500);NEXT I
102 FOR I=1 TO 12:X1=30+18*(I-1):X2=X1+2:
Y1=51:Y2=51-.8*X(I):LINE(X1,Y1)-(X2,Y2),
1,B:FOR J=Y2 TO Y1 STEP 2:LINE(X1,J)-(X
2,J):NEXT J:NEXT I
105 LINE INPUT #1,T3$:LINE INPUT #1,T4$:
LINE INPUT #1,T5$
110 PRINT@ 72,LEFT$(T3$,2);
112 PRINT@ 75,LEFT$(T4$,2);
114 PRINT@ 78,LEFT$(T5$,2);
120 LINE(190,14)-(186,09),1,B
130 LINE(208,14)-(204,09),1,BF
140 LINE(226,14)-(222,09),1,B
145 LINE(226,11)-(222,11),1
150 A$="":A$=INKEY$:IF A$="" THEN 150
160 IF A$="M" OR A$="m" THEN MENU ELSE R
UN

```

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Listing 2

```

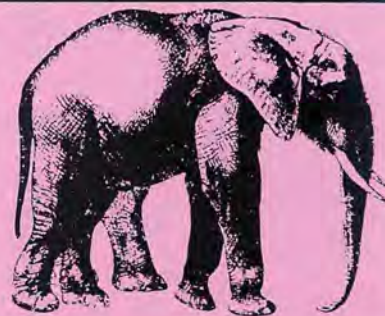
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7 M$="JFMAMJJASOND"
10 CLS
12 PRINT @49,R$;" PCM Bar Chart Plotter
";U$;
15 PRINT @170,"File to Plot: ";:LINE INP
UT FI$
16 IF FI$="MENU" OR FI$="menu" OR FI$="M
enu" THEN MENU
18 OPEN FI$ FOR INPUT AS 1

```

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Home Inventory

Model 100 Portability Makes The Job Easier

By Aileen and John Cornman

Portability has long been the byword of those who take inventory for businesses. From the simplest system of audio tape recorders slung over the shoulder to a whole computer system being pushed around in a shopping cart, efficiently taking an inventory requires that the recording medium be physically taken to the items being tallied. Herein lies the downfall of many home computer-based household inventory systems.

Because you cannot conveniently take your desktop microcomputer with you from room to room, you are likely to revert to pencil and paper with one of the inventory booklets given away freely by insurance companies. With the best intentions to later transcribe the data into your computer, you notice that since the job is essentially done when the booklet is filled in, there is no real urgency to the copying task. The job can be finished with fewer keystrokes by simply using a calculator.

The Model 100 is a handy solution to the home inventory problem. Now you can quite literally stick your head and computer into the refrigerator to type in the model and serial numbers stamped on the plate inside. You can go from room to room, entering each item of data as close to its source as you can possibly get.

Program Overview

After creating two short RAM files with the Model 100's built-in *TEXT* editor, you run the inventory program. You have the opportunity to load all of the inventory RAM files from a single tape file if you have previously created one.

The inventory menu lists seven functions along with a constantly updated indicator of the amount of free memory remaining. The seven options allow you to add an item to a room, delete an item from a room, move an item from one room to another, display all of the items in a particular room, print a complete inventory list with room subtotals and a grand total, display a summary listing of room subtotals only, and to exit from the program.

The exit dialog permits you to save all of the inventory data on tape if you wish and also deletes all of the inventory RAM files when you instruct it to do so.

The file handling capability of the Model 100 makes the inventory task efficient from a computing standpoint as well. RAM files can be handled as essentially variable length strings, eliminating the problem of having to pre-dimension lists for the maximum number of items that they might possibly contain.

The program is easy to learn and simple to use. The instructions that follow provide an exhaustive reference, but should not be taken to indicate complexity of use.

Using The Program

1) Offload as many files and programs

to tape as you can in order to maximize available memory and file slots. The program will create a *.DO* file for each room in your home so you must have as a minimum number of available file slots the number of rooms plus four. The additional four cover the *NAME.DO*, *ROOMS.DO*, *ITEMS.DO*, and *TEMP.DO* files. Although you will never see the *TEMP.DO* file listed, it is necessary to have a slot available for it during item deletions. NOTE: You may skip steps 2 and 3 if you will be reading your inventory files from a previously recorded tape.

- 2) Use the built-in *TEXT* program to create a *NAME.DO* file. Type your name and address information into this file, in upper- and/or lower-case, just as you want it to appear on the printed inventory listing. The program will center each line on the page for you, so just type in the number of lines you want, remembering to end each one with the ENTER key.
- 3) Again, use the *TEXT* program to create a *ROOMS.DO* file. This file should contain one line, terminated with the ENTER key, for each room in your home. Type in the names of your rooms in upper- and/or lower-case with no more than six characters per room name. If you forget about the six-character limit, the inventory program will remind you to make any necessary corrections. You are limited to six characters

(Aileen and John Cornman live in Battle Ground, Wash., where they own and operate their own computer business, Structured Software Services.)

because each room name you type in will be used as the name of a .DO file created to hold the contents of the room.

- 4) Run the inventory program. The opening question asks you if you want to read inventory files into memory from a previously recorded tape. If you have such a tape, answer by pressing 'Y' and continue with step 5, otherwise press 'N' and skip ahead to step 6.
- 5) The program prompts you to press ENTER when your recorder is ready. Pressing any other key bypasses the tape reading, in case you meant to answer the question of step 4 with an 'N'. If the tape input is successful you proceed to step 6, otherwise this step is repeated, allowing you to try reading with a different volume setting or a backup tape.
- 6) The Home Inventory Menu appears and you are ready to update your inventory records. As you return to this menu screen after each completed task, be sure to keep an eye on the free memory indicator. If the indicator should ever drop below 500 bytes, refer to the section on "Running out of memory." Functions are selected from the menu by pressing the appropriate numeric key '1' through '7'. Function keys 'F1' through 'F8' are not used. Refer to the specific instructions which follow, according to what you want to accomplish.

Adding an item to a room

- 1) Press '1'. A menu of room names appears. Select the room to which you want to add the item by pressing the letter key corresponding to the letter that appears next to the name.
- 2) You are prompted to enter the name of the item. Press ENTER alone to return to the inventory menu without adding an item. While item names up to 20 characters long will appear in full on the printed listing, only 11 characters of an item name will be displayed when you use option 4 to display all of the items in a room. Item names may be any combination of upper- and lowercase characters. Memory will be conserved whenever an item name exactly duplicates a name that has already been used. To increase the likelihood of exact matches, we suggest that item names be kept general and be entered in uppercase only. Press the

ENTER key after you have typed in the item name.

- 3) The program prompts you to enter the number of items to which this entry refers. Pressing ENTER alone is equivalent to typing a '1' and pressing ENTER.
- 4) The program asks for the original cost of the item in whole dollars. Type digits only with no dollar sign or commas.
- 5) If you entered a number of items other than '1', you are asked if the cost is on a cost-per-each basis or a total cost basis. If you answer 'E' for each, the program does the multiplication for you and stores the total cost.
- 6) You are prompted to enter the year of purchase. '19' is displayed for you. Type in only the last two digits of the year and press ENTER.
- 7) The program asks for the model and or serial number of the item. Press ENTER alone if you have no such information for this item. You may enter up to 23 characters which will appear in full on the printed listing, although only 12 characters will appear on screen displays. Any descriptive phrase may be entered as a model/serial number; however, to conserve memory, we recommend entering true model/serial information only for valuable items which might be targets for theft. After answering this question, you return to step 2. You may continue adding items to the same room in this manner until you press ENTER alone in response to the request for an item name.

Deleting an item from a room

- 1) Press '4' to display a list of items in the room from which you want to make the deletion.
- 2) Select the room from which the deletion is to be made by typing the letter next to the room name.
- 3) If the item you want to delete does not appear on the first screen, continue pressing ENTER until it is displayed. When it does appear, make a mental note of its item number (the number to the left of the item name).
- 4) Press the 'ESC' key to return to the Inventory Menu.
- 5) Press '2', then select the room from which the item is to be deleted by typing the letter next to the room's name.
- 6) Type in the item number you want to delete and press ENTER. You may

exit without deleting anything by entering an item number of '0'.

Moving an item

- 1) Proceed as in steps 1 through 4 above, to determine the item number of the item to be moved.
- 2) Press '3', then select the room from which the item is to be moved by typing the letter next to the room name.
- 3) When the delete screen appears, enter the item number of the item you want to move.
- 4) Select the room to which you want to move the item by typing the letter next to its name.

Displaying the items in a room

- 1) Select menu option 4, then select the room you want to examine by typing the letter next to its name.
- 2) The contents of the room are listed six items per screen. The top line displays headings for the information on each item listed. The bottom line displays one of two messages: If there are more items to view, you may press the 'ESC' key to return to the option menu, or press ENTER to see the next screen. If there are no more items to be listed, pressing any key returns to the menu.

Printing the complete inventory

- 1) Select menu option 5.
- 2) The program prompts you to properly position the paper in the printer and to press ENTER when it is ready. Pressing any other key returns you to the menu without printing. The printed inventory is formatted for 8½" by 11" paper with margins of one inch on all sides. Output is via the standard parallel printer interface. See Figure 1 for a sample of the printed inventory list.

Displaying room summaries

- 1) Select menu option 6.
- 2) The rooms are listed six to a screen along with the total value of the items they contain. You may press 'ESC' to return to the menu or ENTER to see the next screen of rooms.
- 3) On the final screen, a grand total of all rooms' values is displayed. Pressing any key from the last screen returns to the Inventory Menu.

Changing item information

- 1) Follow the above instructions to delete the item.
- 2) Add the item, including the corrected information.

- 1) Select menu option 7.
- 2) The program asks if you would like to copy all of the inventory RAM files to cassette tape. Answer with a 'Y' if you want to make an intermediate backup of your work so far or to make a final inventory tape for storage. If you answer yes, go on to step 3, otherwise skip ahead to step 5.
- 3) The program prompts you to press ENTER when the recorder is ready to record. Pressing any other key will bypass the tape output function and take you to step 5.
- 4) When the recording is complete, the program asks if you would like to make another copy. Answering with a 'Y' returns you to step 3. 'N' takes you to step 5. It is a good idea to make at least two tape copies of the inventory data.
- 5) The program asks you if it should delete all inventory RAM files. You should answer with a 'Y' only after your inventory is completed and you have two or more copies of the data on tape. Even after you type a 'Y', the program asks for a second

confirmation because this is such an irreversible action. After acting in accordance with your directions, the program returns you to the Model 100's main menu. When you ask the program to delete RAM files, it deletes all individual room and item files but leaves the *NAME.DO* and *ROOMS.DO* for you to delete manually. The reason for this is explained below.

Running out of memory

Depending on the memory size of your computer, you may see the free memory indicator drop below 500 bytes before you have completed your inventory. If this should occur, print out as much of the inventory as you have completed and save the corresponding data on tape. When exiting from the program, request the deletion of all RAM files. The *NAME.DO* and *ROOMS.DO* files will not be deleted, so you may simply run the inventory program again to complete the rooms that were left unfinished. In this way, you may produce the inventory in as many parts as are necessitated by memory limitations. Of course, you will have to manually add the individual grand totals together to arrive at a final figure.

Program Notes

Comments have been avoided in the program to conserve memory. The following information is provided for those readers who may wish to study or modify the program.

The program makes extensive use of the Model 100's RAM file-handling capabilities. In addition to the *NAME.DO* and *ROOMS.DO* files mentioned above, one file is created for each room to which an item has been added. The contents of any of the files may be viewed with the *TEXT* program.

The program verifies that both the *ROOMS.DO* and *NAME.DO* files exist and that room names do not exceed six characters in length. If these tests are passed the contents of the *ROOMS.DO* file are loaded into an array RM\$ which is dimensioned to the exact number of room names in *ROOMS.DO*.

The room filenames are taken from the *ROOMS.DO* file. Each line in a room file consists of an item code, number of items, original cost, year purchased, and model/serial data followed by a carriage return. If model/serial data was not entered, a CHR\$(143) (triangle) is stored as a placeholder.

The *ITEMS.DO* file contains one copy of each unique item name. The

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item code stored in a room file corresponds to the number of the item name within the *ITEM.DO* file. Thus, multiple rooms may contain identically named items, but storage is minimized since the full name appears only once in memory.

When an item is deleted from a room, the room file is copied to a *TEMP.DO* file, omitting the deleted item. The room file is then killed and *TEMP.DO* is renamed as the old room filename. The program never deletes items' names from the *ITEM.DO* file.

Moving items is accomplished by making use of the delete and add routines in succession.

The tape file of inventory data is organized as records written as single "lines." The line/records are as follows:

- 1) The character's "NAME."
- 2) One record for each line in the *NAME.DO* file.
- 3) The character's "ROOMS."
- 4) One record for each line in the *ROOMS.DO* file.
- 5) The character's "ITEMS."
- 6) One record for each line in the *ITEMS.DO* file.
- 7) The character's "EOF."
- 8) A record consisting of a room name.
- 9) One record for each line in the file.
- 10) The character's "EOP."
- 11) Items 8 through 10 are repeated for each room file that exists, whether or not it is empty.
- 12) The character's "EOT."

Summary of significant variables

DI\$ Deleted item record, used for moves.

GT! Grand total of all rooms' costs.

IC Item code. Refers to ICth item in *ITEMS.DO*.

II\$ Item name as entered.

ITS Item name retrieved from *ITEMS.DO*

K\$ Key pressed by user.

L\$ Used to hold a line of data read from a file.

LC Line counter used in printer listing routine.

M Margin variable, used for adjusting printer top margins.

MSS Model/serial data.

NO Number of items in an item entry.

NR The number of rooms minus one.

OC Original cost of an item.

P Screen print position.

RMS The table of room names.

ST! Subtotal of costs in a room.

YP\$ Last two digits of year purchased.

Figure 1. A sample inventory printout.

Home Inventory as of 11/21/83					
Room	Item	No.	Cost	Year	Model/serial
Hall	PICTURES	5	\$125	1978	FABRIC/PRINT
	LAMP	1	\$50	1979	BRASS
	Subtotal		\$175		
Office	COMPUTER	1	\$1,000	1981	III
	COMPUTER	1	\$1,000	1983	100
	TAPE RECORDER	1	\$60	1981	CTR-80A
	DESK	1	\$300	1977	DANISH TEAK
	PRINTER	1	\$300	1981	VII
	TYPEWRITER	1	\$100	1950	S/C
	CHAIR	1	\$45	1979	OAK
	CHAIR	1	\$125	1979	DANISH
	Subtotal		\$2,930		
Bath#1	PICTURES	3	\$45	1979	B/W
	TABLE	1	\$50	1981	WALNUT
	WASTE BASKET	1	\$15	1981	WEAVE
	Subtotal		\$110		
Garage	PING PONG TABLE	1	\$100	1979	GREEN
	Subtotal		\$100		
Grand total			\$3,315		

Line number references:

30-120	Verify <i>ROOMS.DO</i> and <i>NAME.DO</i> , load RMS table.	7000-7300	Routine to write inventory tape.
130-140	Main program loop.	7500-7590	Routine to kill RAM files on request.
1000-1034	Add routine.	7800-7890	Load RAM files from tape if requested.
1080-1086	Display menu of rooms and get valid selection.	7900	Subroutine to copy from one file to another.
1099	Get a key in K\$, wait for key.	8000-8016	Subroutine to search <i>ITEMS.DO</i> file for a match on the name in II\$. If not found, adds II\$ to file. Returns with IC which points to item name entry.
2000-2070	Delete routine.		Retrieves the ICth item name from <i>ITEMS.DO</i> in ITS.
3000-3010	Move routine.		Displays Inventory Menu and gets selection in K.
4000-4050	Routine to list items in a room.		Initialization.
4060-4068	Subroutine to format an item record on the screen.	8500-8504	
5000-5064	Routine to print inventory on printer.		
5900-5902	Subroutine to print headings on inventory pages.	9000-9040	
6000-6500	Routine to display room-by-room summary.	10000-10999	

The listing:

```

2 ***           Home Inventory           ***
4 *** Structured Software Services ***
6 *** 9233 N.E. 269th Street ***
8 *** Battle Ground, WA 98604 ***

```



```

9
30 CLEAR1000:MAXFILES=3:CLS:GOSUB10000:G
OSUB7800
40 ONERRORGOTO60
50 OPEN"NAME"FORINPUTAS1:CLOSE:GOTO70
60 PRINTS1$;"NAME.DO":END
70 ONERRORGOTO90
80 OPEN"ROOMS"FORINPUTAS1:GOTO95
90 PRINTS1$;"ROOMS.DO":END
95 ONERRORGOTO0
100 LINEINPUT#1,RM$:N=N+1:IFLEN(RM$)>6TH
EN104
102 IFEOF(1)THEN110ELSE100
104 CLOSE:CLS:PRINT:PRINT"Room names mus
t not be longer than 6 characters. Pl
ease correct room #";N:PRINT"in ROOMS.DO
file.":END
110 CLOSE:NR=N-1:DIMRM$(NR):OPEN"ROOMS"F
ORINPUTAS1
120 FORI=0TONR:LINEINPUT#1,RM$(I):NEXTI:
CLOSE
130 GOSUB9000:ONKGOSUB1000,2000,3000,400
0,5000,6000,7000
140 GOTO130
1000 CLS:PRINT"Add item to which room?"
1002 GOSUB1080
1008 CLS:PRINT"Add item to ";RM$(K);":":
PRINT"(To exit and not add, just press E
NTER)"
1010 II$="":INPUT"Item name";II$
1012 IFII$=""THENRETURNELSEGOSUB8000
1014 NO=1:INPUT"Number of items (ENTER =
1)";NO
1016 OC=1:INPUT"Original cost (no cents)
";OC
1018 IFNO>1THENINPUT"Cost of (E)ach or (
T)otal";C$ELSEC$="T"
1020 IFC$="t"ORC$="T"THEN1024ELSEIFC$<>"
E"ANDC$<>"e"THEN1018
1022 OC=OC*NO
1024 LINEINPUT"Year purchased: 19";YP$;I
FYP$=""THENYP$="83"ELSEIFLEN(YP$)<>2THEN
1024
1025 IFVAL(YP$)=0THEN1024
1026 MS$="":LINEINPUT"Model/serial: ";MS
$
1028 OPENRM$(K)FORAPPENDAS1
1030 PRINT#1,IC;NO;OC;YP$;
1032 IFMS$=""THENPRINT#1," ";CHR$(143)EL
SEPRINT#1," ";MS$
1034 CLOSE:GOTO1008
1080 FORI=0TONR:PRINT@80+I*10,CHR$(65+I)
; "-";RM$(I); " ";NEXT
1082 PRINT@280,"Press letter next to roo
m name...";
1084 GOSUB1099:K=ASC(K$):IFK>90THENK=K-9
7ELSEK=K-65
1086 IFK<0ORK>NRTHEN1084ELSERETURN
1099 K$=INKEY$:IFK$=""THEN1099ELSERETURN
2000 CLS:PRINT"Delete item from which ro

```

```

om?"
2002 GOSUB1080
2004 CLS:PRINT"Delete from ";RM$(K);": "
2006 PRINT:PRINT"Enter item number from
room list;":PRINT"or":PRINT"Enter 0 to e
xit without deleting;":PRINT:PRINT
2008 INPUT"Item number";N
2010 IFN=0THENRETURN
2012 ONERRORGOTO2050
2016 OPENRM$(K)FORINPUTAS1
2018 OPENTM$FOROUTPUTAS2
2020 I=0
2022 LINEINPUT#1,IT$:I=I+1
2024 IFI=NTHENDI$=IT$ELSEPRINT#2,IT$
2026 IFNOTEOF(1)THEN2022
2028 IFI<NTHEN2060
2040 CLOSE:RM$=RM$(K)+".DO":KILLRM$:NAME
TM$ASRM$:RETURN
2050 GOSUB2054:RESUME2070
2054 CLS:PRINT:PRINT"No such item.":PRIN
T:PRINT"Press any key to continue..."
2056 GOSUB1099:RETURN
2060 CLOSE:GOSUB2054:KILL"TEMP.DO":RETUR
N
2070 CLOSE:RETURN
3000 CLS:PRINT"Move item from which room
?"
3002 DI$="":GOSUB2002
3004 IFDI$=""THENRETURN
3006 CLS:PRINT"Move item to which room?"
3008 GOSUB1080:OPENRM$(K)FORAPPENDAS1
3010 PRINT#1,DI$:CLOSE:RETURN
4000 CLS:PRINT"List items in which room?
":GOSUB1080:N=0
4004 ONERRORGOTO4050
4006 OPENRM$(K)FORINPUTAS1
4010 CLS:P=0:PRINT"It# Item No. C
ost Yr Model/serial"
4012 INPUT#1,IC,NO,OC,YP,MS$:GOSUB8500
4014 N=N+1:P=P+40:GOSUB4060
4016 IFEOF(1)THEN4017ELSE4018
4017 ONERRORGOTO0:CLOSE:PRINT@280,"End o
f list. ";PA$;STRING$(10,32);:GOSUB1099:
RETURN
4018 IFNMOD6<>0THEN4012
4020 PRINT@280,MO$;
4022 GOSUB1099:IFK$=CHR$(27)THENCLOSE:RE
TURNELSE4010
4050 CLS:RESUME4017
4060 PRINT@P,USING"###";N;
4062 PRINT@P+4,LEFT$(IT$,11);
4064 PRINT@P+16,USING"###";NO;
4066 PRINT@P+19,USING"#####";OC;
4068 PRINT@P+24,YP;LEFT$(MS$,12);:RETURN
5000 CLS:PRINT:PRINT"Position paper at t
opmost print line.":PRINT:PRINT"Press EN
TER when printer is ready, or":PRINT:PRI
NT"any other key to exit without printin
g."
5002 GOSUB1099:IFK$=CHR$(13)THENOPEN"NAM

```

```

E"FORINPUTAS1ELSERETURN
5004 OPEN"LPT:"FOROUTPUTAS2
5006 FORI=0TO5:PRINT#2,"":NEXT:ST!=0:GT!=0
5008 PRINT#2,TAB(25);"Home Inventory as of ";DATE$:FORI=1TO3:PRINT#2,"":NEXT:LC=10
5010 LINEINPUT#1,L$
5012 PRINT#2,TAB((80-LEN(L$))\2);L$:LC=LC+1
5014 IFNOTEOF(1)THEN5010
5016 CLOSE1:ONERRORGOTO5018:GOTO5019
5018 RESUME5044
5019 PRINT#2,"":PRINT#2,""
5020 GOSUB5902:LC=LC+4:N=0
5022 IFN>NRTHEN5060
5023 IFLC=59THENM=-5:GOSUB5900
5024 PRINT#2,TAB(10);RM$(N):LC=LC+1
5026 OPENRM$(N)FORINPUTAS1
5028 IFLC=60THENM=-4:GOSUB5900
5030 INPUT#1,IC,NO,OC,YP,MS$:GOSUB8500
5032 PRINT#2,TAB(17);IT$;
5034 PRINT#2,TAB(37-LPOS(0));USING"###";NO;
5036 PRINT#2,USINGD$;OC;
5038 PRINT#2," 19";RIGHT$(STR$(YP),2);
5039 IFMS$=CHR$(143)THENPRINT#2,""ELSEPRINT#2," ";MS$
5040 ST!=ST!+OC:LC=LC+1:IFNOTEOF(1)THEN5028
5042 PRINT#2,TAB(43);"-----":LC=LC+1
5044 PRINT#2,TAB(20);"Subtotal";
5046 PRINT#2,TAB(12);USINGD$;ST!:LC=LC+1
5047 IFLC>59THENM=LC-64:GOSUB5900
5048 GT!=GT!+ST!:ST!=0:CLOSE1:N=N+1:GOTO5022
5060 PRINT#2,TAB(43);"-----":PRINT#2,TAB(10)"Grand total";
5062 PRINT#2,TAB(19);USINGD$;GT!
5064 CLOSE:ONERRORGOTO0:RETURN
5900 FORLC=MT07:PRINT#2,"":NEXT
5902 PRINT#2,TAB(10);"Room Item";TAB(16);"No. Cost Year Model/serial":PRINT#2,"":RETURN
6000 ONERRORGOTO6500:I=0:GT!=0
6002 CLS:PRINTTAB(6);"Room-by-room Summary of Cost"
6004 ST!=0:OPENRM$(I)FORINPUTAS1
6006 INPUT#1,IC,NO,OC,YP,MS$
6008 ST!=ST!+OC
6010 IFNOTEOF(1)THEN6006
6012 PRINTRM$(I);:PRINTUSINGD$;ST!:GT!=GT!+ST!
6014 CLOSE:I=I+1:IFI>NRTHEN6020
6016 IFIMOD6<>0THEN6004
6018 PRINT@280,M0$;:GOSUB1099:IFK$=CHR$(27)THENRETURNELSE6002
6020 PRINT@280,"Grand total = ";:PRINTUSINGD$;GT!;:PRINT" ";PA$;
6022 GOSUB1099:RETURN

```

```

6500 RESUME6012
7000 CLS:PRINT:PRINT"Copy RAM files to tape? (Y or N)":GOSUB1099
7002 IFK$="N"ORR$="N"THEN7500
7004 PRINT:PRINT"Press ENTER when recorder is ready,":PRINT"or":PRINT"any other key to exit without recording."
7006 GOSUB1099:IFK$<>CHR$(13)THEN7500
7008 OPEN"CAS:HOMINV"FOROUTPUTAS2
7010 ONERRORGOTO7300:N=0
7012 PRINT#2,"NAME"
7014 OPEN"NAME"FORINPUTAS1
7016 GOSUB7900
7018 IFEOF(1)THENCLOSE1ELSE7016
7020 OPEN"ROOMS"FORINPUTAS1
7022 PRINT#2,"ROOMS"
7024 GOSUB7900
7026 IFEOF(1)THENCLOSE1ELSE7024
7028 OPEN"ITEMS"FORINPUTAS1
7030 PRINT#2,"ITEMS"
7032 GOSUB7900
7034 IFEOF(1)THENCLOSE1:PRINT#2,"EOF"ELSE7032
7038 IFN>NRTHEN7100
7040 OPENRM$(N)FORINPUTAS1
7042 PRINT#2,RM$(N)
7044 GOSUB7900
7046 IFEOF(1)THENCLOSE1:PRINT#2,"EOF"ELSE7044

```



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```

7048 N=N+1:GOTO7038
7100 PRINT#2,"EOT":CLOSE:CLS:PRINT:PRINT
"Recording complete.":PRINT:PRINT"Make a
nother copy? (Y or N)"
7102 GOSUB1099:IFK$="Y"ORK$="y"THENCLS:G
OTO7004ELSE7500
7300 RESUME7048
7500 CLS:PRINT:PRINT"Kill all RAM files?
(Y or N)"
7502 GOSUB1099:IFK$<>"Y"ANDK$<>"y"THENME
NU
7504 PRINT:PRINT"All inventory files wil
l be deleted.":PRINT:PRINT"Please confir
m: (Y or N)"
7506 GOSUB1099:IFK$<>"Y"ANDK$<>"y"THENME
NU
7508 ONERRORGOTO7509:KILL"ITEMS.DO":GOTO
7510
7509 RESUME7510
7510 ONERRORGOTO7590
7512 FORN=0TONR
7514 RM$=RM$(N)+".DO":KILLRM$
7516 NEXT:MENU
7590 RESUME7516
7800 PRINT:PRINT"Read inventory files fr
om tape? (Y or N)";
7802 GOSUB1099:IFK$<>"Y"ANDK$<>"y"THENRE
TURN
7804 PRINT:PRINT"Press ENTER when record

```

```

er is ready,":PRINT"or":PRINT"any other
key to exit without reading.";
7806 GOSUB1099:IFK$<>"CHR$(13)"THENRETURN
7808 OPEN"CAS:HOMINV"FORINPUTAS1
7810 ONERRORGOTO7890
7812 LINEINPUT#1,L$
7814 IFL$<>"NAME"THEN7880
7816 OPENL$FOROUTPUTAS2
7818 LINEINPUT#1,L$
7820 IFL$="ROOMS"THENCLOSE2ELSEPRINT#2,L
$:GOTO7818
7822 OPENL$FOROUTPUTAS2
7824 LINEINPUT#1,L$
7826 IFL$="ITEMS"THENCLOSE2ELSEPRINT#2,L
$:GOTO7824
7828 OPENL$FOROUTPUTAS2
7830 LINEINPUT#1,L$
7832 IFL$="EOF"THENCLOSE2ELSEPRINT#2,L$:
GOTO7830
7834 LINEINPUT#1,L$:IFL$="EOT"THENCLOSE:
CLS:RETURN
7836 OPENL$FOROUTPUTAS2
7838 LINEINPUT#1,L$
7842 IFL$="EOF"THENCLOSE2:GOTO7834ELSEPR
INT#2,L$:GOTO7838
7880 CLOSE:PRINT:PRINT"Tape error. Press
ENTER to retry":GOSUB1099:CLS:GOTO7804
7890 RESUME7880
7900 LINEINPUT#1,L$:PRINT#2,L$:RETURN
8000 ONERRORGOTO8003
8002 IC=1:OPEN"ITEMS"FORINPUTAS3:GOTO800
4
8003 IC=0:RESUME8010
8004 LINEINPUT#3,IT$
8006 IFIT$=II$THEN8016
8008 IFEOF(3)THEN8010ELSEIC=IC+1:GOTO800
4
8010 CLOSE3:OPEN"ITEMS"FORAPPENDAS3
8012 ONERRORGOTO0
8014 IC=IC+1:PRINT#3,II$
8016 CLOSE3:RETURN
8500 OPEN"ITEMS"FORINPUTAS3
8502 FORI=1TOIC:LINEINPUT#3,IT$:NEXT
8504 CLOSE3:RETURN
9000 CLS:PRINTTAB(10);"Home Inventory Me
nu"
9010 PRINT"(1) Add item.":PRINT"(2) Dele
te item.":PRINT"(3) Move item.":PRINT"(4
) Display list of items in a room."
9020 PRINT"(5) Print complete inventory.
":PRINT"(6) Display room-by-room summary
.":PRINT"(7) End program.";
9025 PRINT@302,FRE(1);"bytes free";
9030 GOSUB1099:K=VAL(K$)
9040 IFK<10RK>7THEN9030ELSERETURN
10000 DEFINTA-Z:TM$="TEMP.DO"
10010 S1$="Please create required file:
":PA$="Press any key":MO$="Press ESC to
exit, ENTER for more...":D$="#####,"
10999 RETURN

```

FullVu 100

for the TRS-80 Model 100 Portable

Have 50 or more previous screen displays available on-line when communicating with information utilities (Dow Jones, CompuServe, MCI Mail, Official Airline Guide, etc.).

FullVu 100 uses the available memory of the Model 100 to save screen displays during on-line connections. The more available memory, the more on-line displays. Redisplay of previous screens is controlled by simple cursor key action a screen at a time — all while maintaining the host connection.

Features of FullVu 100

- Machine code program for efficiency and speed
- Supports ADRS.DO file for auto dial and auto logon
- Supports direct or acoustic modem connection
- Supports printer port for hard copy
- Supports full/half duplex

Dynamic, cyclic buffer ensures continuous data capture — you can't run out of buffer space. Size of capture buffer not preallocated — expands to use all available memory on each connection.

Operates on 24K or 32K Model 100
Supplied on cassette with manual

\$39.95

THOMAS Software
2632 Sumac Ridge
White Bear, MN 55110

Creating Categorical Directories

By Lawrence C. Falk

One of the more interesting functions which you can perform with the Tandy 2000 is to place individual programs in separate directories to make it easier for you to access and use them.

Sound a bit complicated? Perhaps. Yet, all in all it is not only easy, but makes things easier for you.

Let's take an example of a program which you may have purchased — or may wish to purchase — for your 2000. The example I will use is *Multiplan* by Microsoft, a spreadsheet program which I happen to think is excellent.

Now, let us further suppose that you have either a hard disk on your 2000 or a number of additional files on your floppy (with the capacity of the 2000's drives, that is not hard to do).

One of the easiest ways to call up a spreadsheet that you have already created is to have *Multiplan* "look up" the filenames for you. This is especially important when you have a lot of files — as I do — and cannot remember the names of all of them. "Now," you may think, "was that file named 'SUBS' or 'SUBSCRIP'?" With *Multiplan*, you need only press the cursor keys once you have told the program to load in a spreadsheet and it will display all the files on the drive.

Oh, oh. There are a lot of files on the drive. Sorting through all of them (especially with a hard disk that will show all your system files as well) is almost as much trouble as remembering the name of the file in the first place.

How can I get all those extra files off the display?

The most simple way is to create a special directory for the application that you will be using and simply move all of

the files that are used with that application into that directory. In the case of *Multiplan*, there are several of them.

Since *Multiplan* deals primarily with numbers and dollars, I created a directory called "\$" for its files. You do this by simply using the following command:

```
MKDIR $
```

This creates a directory called "\$" and, if you will simply run a directory of your main disk, you will find a new entry for "\$" that shows as a (DIR) in the list.

Your next step is to copy all of the files which pertain directly to that program to the new directory. One of those files is called *MP.EXE*, so you just move that file to the new directory with this command:

```
MV MP.EXE \$
```

The MV means "move," the "MP.EXE" is the name of your file and the backslash and dollar sign are how you designate the new directory. You then perform this same function for all of the files which have anything to do with *Multiplan*.

Once you have done that, you can ask the 2000 to list the main directory with the DIR command, and you will note that all of the files which you just moved are gone.

Where did they go? To the new directory called "\$" that you just created. In order to see them, simply execute the following command:

```
CD \$
```

You will then see the directory for "\$" and note that all the files you moved are listed there.

If you will then go into *Multiplan* and work the cursor keys to load a file, you will see that only your spreadsheet files

are listed. This eliminates clutter and makes things much easier for you to see what is going on.

This procedure will work with any programs which read the directory and display files for you. Examples of other programs are *WordStar* and *MultiMate*, both word processing programs. It makes things much easier for you to have only the files which pertain to the particular programs showing on the screen.

There is another advantage, too. Someone cannot just "run" your programs by typing in a name that is to be found on the main directory. Things are a little more complicated, because they don't even see your application programs in the first place. And, they don't see all the files, either. Who, if his name were Jim, could resist trying to see what is in "FIRE-JIM" if he accidentally saw it on the main directory?

Since "FIRE-JIM" would never appear on the main directory, it would take some understanding of your own file system to "get" to the directory where the file — and its application program — are located.

For you to get there, all you do is change the directory, using the CD \ \$ command. And, incidentally, to get back to your main directory, all you need to do is type in CD \ with no directory specified. You will be right back in the main directory.

If changing all these directories seems to be a bit cumbersome to you, we'll explore a way that you can do it automatically in next month's issue of PCM. And, while we're at it, we'll make an automatic backup of your data in the process.

In the mid-1950s, a popular music group called the Chordettes had a hit song that began, "Mr. Sandman, bring me a dream. . . ." Well, nearly 30 years later, PCM Contributing Editor Jim Hawk is making the same request — though his entreaties, rather than being directed at a silicon-slinging nocturnal elf, are aimed at the silicon giants of industry, the computer designers and manufacturers who produce machines capable of creating dreams of their own.

Dream Portable . . . Or Reality?

By Jim Hawk
PCM Contributing Editor



How about something like this: a portable computer with a 24 x 80 fold-up display using a color LCD screen with back-lighting, 128K to one megabyte RAM, 12 function keys with separate LCD windows, a built-in 3.5-inch magnetic disk, and maybe equipped with a 4-inch laser disk that holds the equivalent of an entire encyclopedia set on a single disk? And how about a built-in cellular phone or some other method to create a "wireless modem"?

Just for fun, the other day, I started drawing up a list of the "ultimate" portable. Part of it reflected current limits of technology while part was pure fancy. As it turns out, I ended up having to rewrite the article before submission because other manufacturers introduced

products in the past month that met or exceeded my original "specifications."

Now is the time to be dreaming, however, because Tandy may just make your dream come true pretty soon. One magazine recently reported that a Kyocera executive said his firm was working on a new portable model for Tandy — a story quickly denied by Tandy. One company official may have made an unconscious slip though, telling me that Kyocera isn't authorized to make such a product announcement. Kyoto Ceram-

ics makes the Model 100 for Tandy, and the same basic design appears in the NEC 8201, as well as the OM-10 from Olympia. The main substance of the rumor was that Tandy wants to offer a bigger display and more memory while keeping the cost under a thousand dollars. One interesting fact: Tandy hasn't been saying Model 100 in their new software or Disk/Video Interface documentation — the text refers simply to "portable computer."

Another driving force is the several major personal computer makers who have joined the portable revolution: Apple, Kaypro and Hewlett Packard have all either demonstrated or announced portables. The HP has just set the next plateau for others to aim at: 396K of built-in programming, including *Lotus 1-2-3*, as well as 296K of RAM, a fold up 16 x 80 screen and MS-DOS compatibility. Apple's IIc can run hundreds of programs already written for the IIe, although it's not yet a true portable since the battery pack and LCD screen (both outboard add-ons)

(Jim Hawk has been working in radio news for the past 12 years and has a science and electronics background. He also does free-lance writing in Washington, D.C.)

have not been made available. And multiple rumors about Kaypro have them specifying a Japanese-made unit with IBM-compatibility and a "full-size" screen — (generally considered to be 24 x 80). Probably most crucial of all, in a one-column article that went largely unnoticed, the Wall Street Journal recently reported that the giant American chip maker, Intel Corporation, had licensed a Japanese firm to manufacture and market CMOS versions of the popular 8086 and 8088 microprocessors, as well as all their support circuits. Model 100 owners can already attest to Japanese competence in battery-powered computer hardware, and the licensing of these "IBM chips" foreshadows a flood of low-current computers that probably will be able to operate on batteries. Intel said it's the first time the company has licensed CMOS products to the Japanese. (RCA made a similar licensing move with their research and development of the liquid crystal display . . . now it's a Japanese-only specialty).

One of the main holdups for Apple and others promising the much larger LCD screens is availability: mass production is just getting started. But as soon as larger volumes of these screens become available, bright and bulky TV screens will be on the way out. One recent survey said that portable computers are the fastest-growing area in the personal computer field right now. It went on to project that by 1989, a good 30-40 percent of all computers sold would be of the portable variety. I don't think I'd be going out too far on a limb to predict that that figure may indeed be *much* higher as soon as the general public discovers the improvements that portables offer. No more blinking of the power to crash that report you've been writing on the word processor all day. And when you want to stop working on a project, just turn the computer off like any other appliance, resting assured that all your work and associated software will be automatically waiting for you when you return. The well-documented biggest fear of any computer user is to see his work go down the tube with the mistaken tap of a key or drop in power. And a year after the 100's introduction, people still find it hard to believe there could be a computer that stores multiple text and BASIC files with absolute (well, nearly absolute) certainty that the information will not be lost by anything other than a deliberate "Kill" order.

What this is all leading up to is the fact that micro-electronics certainly now allows shrinking of all but the keyboard and screen dimensions. I see people going through a museum in the not-too-distant future, shaking their heads at those huge bulky personal "computers" that took up most of a desk and/or bank account. Let's take that wish list one item at a time, expanding a bit on the technical breakthroughs to date.

► The 24 x 80 display (six times the information presented by the Model 100's LCD) is already a laboratory reality and will soon be on sale. Apple is telling buyers of their new IIc that a 24 x 80 LCD screen will be available by the end of the year. All signs point to Kaypro having the same size screen when their portable makes its debut. Already, the Gavilan and Hewlett Packard portables sport 16 x 80 screens. And, concerning the "color LCD screen with backlighting," Seiko of Japan introduced a 2-inch screen color TV in early June using their breakthrough in layering LCD colors on top of each other. The working unit I saw had true colors, although not too bright. I'll be generous and give Japan Inc. five years to scale that up to a usable computer screen.

► RAM sizes ranging from 128K to a Megabyte: Both figures are probably far too conservative after HP was able to introduce a 256K model within a year of the fully-chipped 32K Model 100. The price is still high (\$2795) but that's bound to tumble with upscaled production and competition. As soon as the 64K CMOS RAM chip becomes a production reality, portables in the megabyte range will be easy. Once people wake up to the fact that hot-running chips on today's line-powered models drastically cut the life of components, the cool CMOS variety will become the standard.

► This function key idea has only appeared on one British-made computer — but the keys themselves were of the "membrane" variety, so we won't count it. Why not take 12 little watch-size LCDs and install them directly above a dozen contoured function keys? That way, they always are defined and there's no confusing the labels and keys. They could stay on all the time and not interfere with the main screen display.

► Magnetic or laser disks in a portable — the 3.5-inch diskettes now appearing on products like Macintosh may become the replacement standard

for 5-inch disks. Outboard portable disk machines are here: one is being sold by Portable Computer Support Group to match the Model 100. As for built-ins, Gavilan originally went with a 3-inch disk for its machine but changed to the 3.5-inch design when it started to become the *de facto* standard. Another portable disk drive is being offered by HP to complement their Model 110. The Sony system promises up to a megabyte of storage per disk, but let's talk giga-bytes for a moment. The one billion mark will be passed in a flash if two giants have their way: IBM and North American Phillips recently signed a co-operation agreement to develop the 4-inch laser disk into a computer storage device. It's currently being snapped up by audiophiles in the form of the Sony/Phillips digital audio disk players. The possibilities for a laser-disk based information/retrieval system are light years ahead of anything else. Already, the Air and Space Museum in Washington is selling full-size laser disks containing 100,000 pictures each. Their press release said that's the equivalent of 37 cabinet files!

► "Wireless Modem" — far fetched you say? Sorry, already invented and operational. Motorola has been the technological leader in this field, first introducing alphanumeric pagers that have little LCD screens that readout the name and phone number of the person to call and even have a limited memory to store messages for later viewing. Now, the latest is a miniature keyboard that not only receives but sends information to a nearby receiver. Industries that track materials by bar coding have been the first to buy the systems. Employees can go around the plant with their bar code reader/computer/radio transmitter and interact directly with the mainframe. LXE, a division of Electromagnetic Sciences, in Norcross, Ga., currently markets a pair of hand-held radio-linked terminals.

To combine all these technological wonders into a single package seems impossible now, but what about five years from now? Call me a dreamer, but imagine yourself going back in time just five years and trying to convince your friends you'd soon carry around your computer like a notebook.

I've tried to lay down a few challenges to the engineers, but in five years, who knows? Maybe we'll be into artificial intelligence and talking computers that don't even bother with keyboards.

PCM

Directly connecting your Model 100 to your multi-line office phone is no problem with Radio Shack's new Multi-Line Controller

Going Online At The Office With PoCo

By Carl Oppedahl

So you have your shiny new Model 100, and have dazzled your friends by calling up the Official Airline Guide (or some other computer) from home. Then you take it to the office, and there's no place to plug it in.

"The cable that runs from the switchboard to the phone is as big around as my little finger," you say to the Radio Shack salesperson. "The connector doesn't look anything like the modular plugs at home."

"No problem," is the reply. "Just pick up the Multi-Line Controller (43-233, \$39.95) or the Single-Line Phone Tap (43-271, \$14.95) and install it yourself between the phone and that big cable." So you pick one up and take it to the office.

Sure enough, it has male and female connectors that fit neatly between the phone and the cable, and the installation takes only five minutes. And there's a familiar looking modular jack for the beige Model 100 modem cable. You nervously try out the phone again, and it works fine.

The moment of truth arrives. Having edited your ADRS file to account for the fact that in the office you must dial '9' for an outside line, you try to auto-dial the OAG.

No good. The Model 100 makes scratchy noises, and never logs you in to the OAG. After 10 minutes and three more attempts, the admiring crowd around you becomes merely tolerant and disperses.

"Maybe the problem is just in the dialing," you think to yourself. So you

dial 9 and the Tymnet number on the phone itself, then push the "Term" key on the Model 100.

Well, progress of a sort. You are able to log in and use the OAG, but all over the office the line is blinking as if a call were on hold. Naturally enough, others in the office pick up on that line to see why a call is on hold for so long. Each time they do it, they hear a load squeal, and you lose half a dozen characters.

What is to be done? The recently released Multi-Line Adapter from Radio Shack (Cat. No. 43-117, \$4.95) may be the answer, and it is the purpose of this article to explain why.

Phone Signals

To understand the wiring in a typical office, it is instructive to review first the simpler wiring in the home.

Most residential phone jacks have four contacts, but only two are active, namely the red and green lines, often called "ring" and "tip." The other two wires, if present, are yellow and black, but serve no function except, perhaps, as a source of low voltage AC (alternating current) for phones that light up at night.

The phone instrument accomplishes everything, from ringing and dialing to voice communications through just the *tip* and *ring* signals. As a result the phone line cord often does not even contain a third and fourth conductor.

Not all phones that light up require an external power source on the yellow and black wires. The phones that light up in green use LEDs (light-emitting diodes) powered from the red and green wires.

Hold Button

In an office where the phones have hold buttons and other special features, there are often many wires other than tip and ring which must be handled by the phone instrument, and by any

computer device that is to mimic a phone.

In the highly standardized "2500 key set" with five lines and a hold button, these other wires include special circuits for ringing the bell, lighting up the five lights, and putting calls on hold. For each of the five lines there is a ring signal, a trip signal, a lamp signal, and a so-called "A-lead" signal. Although the office switchboards made by different companies vary somewhat, in general the lamp signal is for informational purposes only and there is no strict requirement that it be hooked up to anything.

When a device other than a conventional telephone is being hooked up, however, the "A-lead" signal, which has to do with putting calls on hold, usually cannot be left unaccounted for. When a Multi-Line Controller or Single-Line Phone Tap is connected, it brings the A-lead signals out on the yellow and black pins of the modular jack. The usual connections are shown in Table I.

Many answering machines and other telephone devices have a relay inside to handle the yellow and black leads. Basically, whenever the phone is to be "off the hook" (in use) the usual connection is made to the red and green wires and, in addition, a relay shorts together the yellow and black wires. When the phone is to go back "on hook" (not in use) the connection at the red and green wires is broken before the connection between the yellow and black is broken.

The Radio Shack PHONE connector has provision for handling the tip and ring signals, but not for handling the A and A1 (yellow and black) signals. The reason, I'm sure, is that to squeeze in an A-lead-control relay, it would have been necessary to leave out something else.

Besides, in those homes where the phones light up with the help of an AC adapter, an A-lead-control relay would

(Carl Oppedahl is a lawyer specializing in technological litigation and author of the soon to be published book, Advanced Programming of The Model 100.)

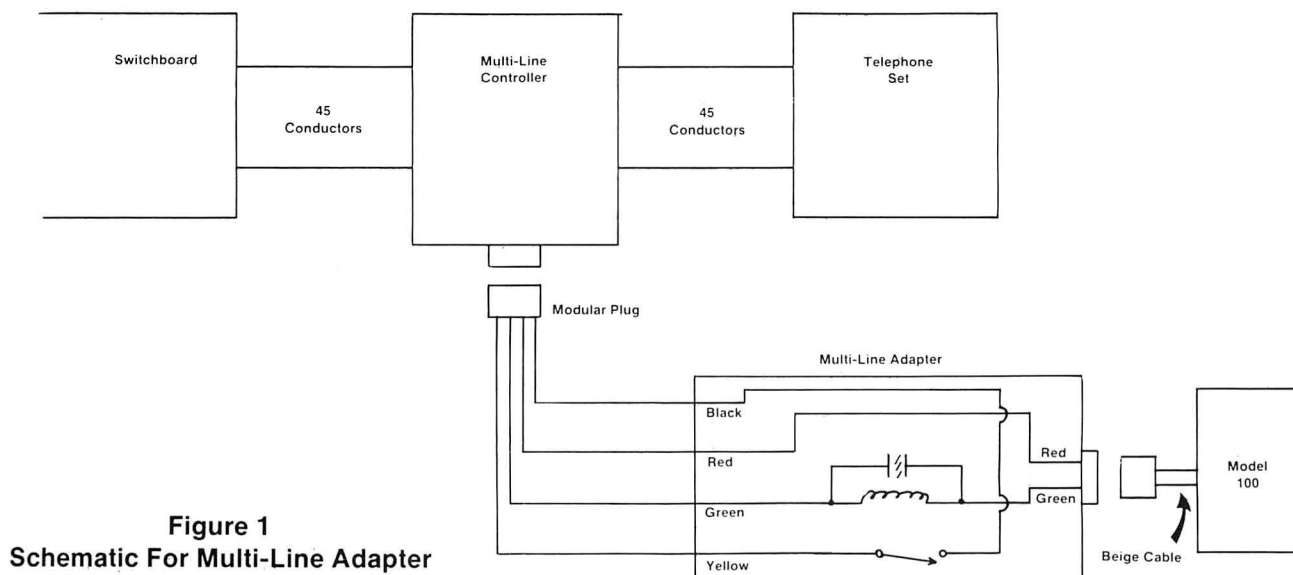


Figure 1
Schematic For Multi-Line Adapter

short out the AC adapter, sooner or later damaging either the adapter or the Model 100.

Some answering machines have an "A-lead" switch to disable the A-lead-control relay for use in the home. Imagine trying to find space for yet another switch around the edge of the Model 100!

The Multi-Line Adapter, though simple in concept and in design, took a long time to reach the market. Because it connects directly to phone lines, it must be FCC approved (under Part 68 of the FCC Rules), which takes lots of time and money. Keep in mind, however, that the Part 68 approval does not ensure that a telephone product does what it is supposed to — it simply indicates that the device will probably not electrocute phone workers even if it is dropped on the floor many times, and that if it fails, it will only screw up your phone service and not someone else's.

The FCC registration number for the Multi-Line Adapter, AA07HD-12138-AD-N, indicates that it is an adapter ("AD"), which is no surprise, and that it cannot dial phone numbers by itself ("N").

What It Does

What exactly does the Multi-Line Adapter do? It watches for current flow in the loop made up of the red and green (tip and ring) signals. Whenever current flows, the yellow and black wires (A and A1) are shorted. The Radio Shack catalog description incorrectly characterizes these signals as "I and A1."

The schematic of the device is shown

in Figure 1; typical Model 100 connection is shown. From the switchboard some 40 volts are available at the tip and ring conductors at the left. When the Model 100 is "on hook," it provides a

Table 1

Connections in Multi-Line Controller

Line	Rip	Ring	A	A1
1	26	1	27	2
2	29	4	30	2
3	32	7	33	2
4	35	10	36	2
5	38	13	39	2

very high resistance at the tip and ring conductors at the right, so that essentially no current flows through the relay coil. The voltage drop across the coil, which is proportional to the current, is quite small.

When the Model 100 goes "off hook," presumably to dial a call, its tip-ring resistance goes to perhaps 600 ohms. Several tens of milliamperes of current flow through the Model 100 (and thus through the relay coil), and the relay closes, shorting the yellow and black conductors.

An electrolytic capacitor is provided (100 microfarads at 10 volts) to keep the relay from chattering during dial pulses and the like. Note that the relay coil and contacts are each capable of handling direct current in either direction. In particular, the electrolytic capacitor is non-polar, so that it can handle either polarity. This is a good thing, since the polarities vary from office to office.

The ringer equivalence number (REN) indicates how much current a telephone device draws across the tip and ring signals when the phone is ringing. It is easy to see why the Multi-Line Adapter has a REN of 0.0. There is simply nothing connected between the red and green wires.

Not A Cure-all

The Model 100 dials numbers with dial pulses, just like a rotary phone dial. Some switchboards do not accept dial pulses, but instead require that dialing of numbers be done with DTMF (dual tone multifrequency, commonly called Touch-Tone, a registered trademark of AT&T). The Multi-Line Adapter will not help the dialing if this is the problem. But it will at least allow you to use the "Term" key without having "hold" lights flash on other phones.

Dialing 9

It bears repeating, at this point, that in some offices one must pause for a new dial tone after dialing 9. When setting up an autodial sequence in the ADRS file, the "equals" sign may be used within the phone number for a two-second pause. The Radio Shack Model 100 User's Manual is less than clear on this.

Conclusion

I do not recommend that you try to build it yourself; your work would not be FCC approved. Besides, at \$4.95 it is cheaper than the parts purchased separately.

For some office installations, it is a must. And you can't beat the price.

PCM

Part II — More Power To You

By Danny Humphress
PCM Technical Editor

Hope you had a good time dBASEing during (and after) the first installment of the Tutor. We did little more than whet your appetite for the real fruits of dBASE last month; today, some of your hunger for more powerful database manipulation commands will be satisfied. Although, like Chinese food, you'll soon crave more.

In dBASE Tutor Part I we created a database, added 14 records and printed several reports according to selected criteria. In our second installment, we'll look up specific records, display them, and make changes to them.

Our goal is, of course, to use dBASE II as a programming language — a capacity in which it excels. Don't let that scare you away, though. dBASE II is not quite as threatening as those "other" programming languages. Its elegant simplicity makes it a cinch to learn and the power of its commands frees you from the tedious programming that has sent more than one prospective programmer back to drawing pictures on cave walls.

Gentlemen and Ladies, Start Your Computers

Search through your disk files for our dBASE "play" disk. We'll be using the database that you so expertly created last month. Get dBASE up and running and to the "dot prompt." Tell dBASE that you'll be using the "MAIL" file — you remember how, don't you? Type:

USE MAIL Press ENTER

The disk will spin for a moment, and another dot prompt will appear. dBASE now knows that all the subsequent commands we issue will affect the "MAIL" database file.

Locating A Specific Record

What good would a database management system be if we could only add records to it and not get the information back out of the computer. dBASE II provides several ways for locating specific records in the file. You already know about using the *LIST* command to display selected records. *LIST* can also be used to display a single record by making the selection criterion very specific. For instance, to see the data for Spectrum Projects, you could type:

LIST FOR NAME = "Spectrum
Projects" press ENTER

This would go through all 14 of the records and print only those whose name was "Spectrum Projects." Note here that since we used uppercase and lowercase for the names when we entered the records, we must use the same case when we are searching for a specific record. To dBASE, "S" and "s" are not the same character. There are ways around this that we'll discover a little further down the road.

Try this:

LIST FOR NAME="S" Press ENTER

Surprise! You get two records, one for "Skyline Marketing Corp." and one for "Spectrum Projects." This is a very handy feature used throughout dBASE II that lets you just enter enough characters to distinguish your target record from the others. Try:

LIST FOR NAME="Spec" Press
ENTER

Because no other name begins with "Spec," only Spectrum Projects was displayed.

Using LIST is just one of the ways to

find specific records; another is the LOCATE command. LOCATE searches through the database to find the first record that matches your selection. Unlike list, locate will only find a single record and it will not automatically display it on the screen. Instead, it makes the selected record the "current record" so that other dBASE commands can use this particular record. Type:

LOCATE FOR NAME="Radio
Shack" Press ENTER

The disk will grind for a second and a dot prompt will appear. dBASE has searched through the records, starting with record one, and stopping when it found "Radio Shack" (record two). Record two is now the "current record" in dBASE memory. To see what's in this record, type:

DISPLAY press ENTER

The current record (#2) will be displayed.

DISPLAY can also be used, like LIST, to display only certain fields in a record. For instance, if you type:

DISPLAY NAME,TELEPHONE
Press ENTER

Only the name and the telephone number for record number two would be displayed.

Changing The Current Record

In addition to LOCATE, you can use another command to change the current record — GOTO. GOTO is used to go directly to a specific record number. To make record number 11 the current record, type:

GOTO 11 Press ENTER

To display record number 11 now,

just issue a DISPLAY command:

DISPLAY Press ENTER

A neat thing about the GOTO command is that you don't have to use it! Huh? Yes, you don't have to use it. A much simpler way to go to a specific record is to simply type the record number at the dot prompt. Try:

8 Press ENTER
DISPLAY Press ENTER

As you can see, it makes no difference whether or not you use the GOTO command. If you just enter a number, dBASE figures out what you're trying to tell it.

EDITing A Record

One of the great things about a computerized filing system, as opposed to its paper counterpart, is that you can make as many corrections and updates that you like without a lot of waste paper, corrections and scratch marks. Making a change in a record is as simple as typing over the old data.

dBASE gives us the EDIT command for this purpose. The format for using the edit command is:

EDIT recordnumber

Suppose we want to edit record number two. Type:

EDIT 2 Press ENTER

What you will see on the screen will look very similar to the form that appeared when you added records, except that the blanks are already filled in. You can use the four direction arrow keys to maneuver your cursor over the part you want to change and just type over. Pressing ENTER moves you to the next field. When you press ENTER at the last field, the edit for that record will end and the next record (#3 in this case) will be displayed for editing. When you are finished editing, press CTRL Q to leave the edit mode. Your alternative to pressing CTRL Q is to keep editing until you reach the last record in the database file.

Remember when we talked about the "current record?" EDIT is one of the commands that takes advantage of this. The command to edit the current record is:

EDIT #

The number sign (#) can be used almost anywhere in dBASE II where you would normally use a record num-

ber. It simply means, "use the current record."

This is the most common form of the edit command. You would normally use a command such as LOCATE to find the record you want and then use EDIT # to edit it.

Let's see how this would work. Suppose we wanted to edit the record for Dennison but we didn't know (or care) what its record number was. We would do the following:

LOCATE FOR NAME="DENNI
SON" Press ENTER

EDIT # Press ENTER

LOCATE finds the record in the database and makes it the current record and EDIT # allows us to make changes to it. There is no need to change this record, so just press CTRL Q to quit the edit mode.

Here's a helpful hint: Even if you do not want to actually change information on a record, EDIT is a nice way of displaying single records if you want to see *both* the data and the field names. DISPLAY, on the other hand, displays *only* the data and not the field names, making it hard to understand what you're seeing. **PCM**

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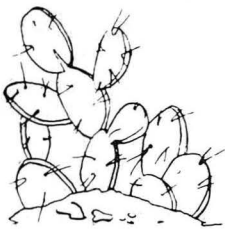
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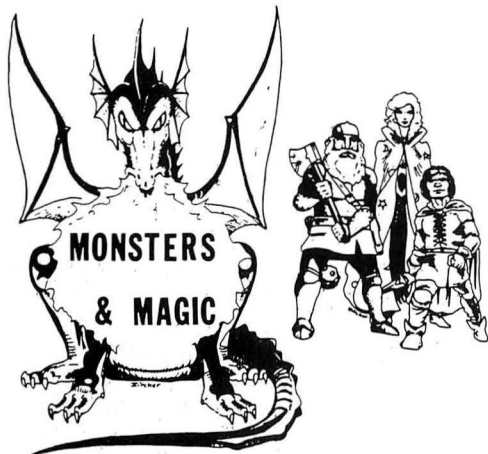
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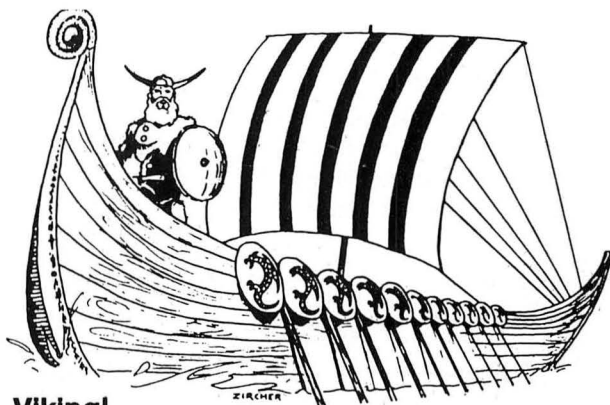
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Mastering MS-DOS

Part III — Exploring MS-DOS Commands

By Danny Humphress
PCM Technical Editor

Welcome, explorers, to the third day of our trek through the world of MS-DOS. We've been exploring the outer reaches of this new realm, working our way inward uncovering its many riches. Today's journey will take us even further.

In Part II, we began using MS-DOS's commands to format and duplicate disks and to backup the hard disk. Today we're going to explore many more MS-DOS commands to do everything from clear the screen to printing the list of files on a disk.

Let's Get Started

Get (or make) a backup copy of the MS-DOS disk that came with your Model 2000 and boot your system with it ("boot" is computer talk for "start up"). If you have a 2000HD hard disk system which automatically boots from the hard disk, boot from the floppy anyway.

Don't forget to enter the correct date and time when MS-DOS asks.

As we have already learned, a disk is a collection of files. MS-DOS provides a command to allow us to get a list of the files on the disk. With the backup of your MS-DOS disk in drive A:, type:

DIR Press ENTER

You should get something like what's in Figure 1. DIR displays five columns

of information. The first column is the filename, the second is a three-character extension, the third shows the size of the file in bytes, the fourth and fifth columns show the date and time that the file was last updated. We talked about filenames in MS-DOSsier Part I if you would like to refresh your memory at this time.

Suppose you don't care about the size or "change date" of the files — you just want to know which files are on the disk. The "/W" wide display switch of the DIR command gives you that option. Try:

DIR /W Press ENTER

The filenames will be displayed across the screen as in Figure 2.

Often there are more files on a disk than can be displayed on the screen at a time — especially when not using "/W." DIR normally just makes the directory fly by. When it is finished, only the last 20 or so files are still on the screen, the others having scrolled off the top. Another DIR switch solves this problem. "/P" causes DIR to pause until you strike a key after it displays a full screen of directory listings; it then proceeds to display the directory one page at a time. This format of the DIR command is:

DIR /P

Go ahead and try it.

(Danny Humphress, PCM's Technical Editor, is the owner of a computer software and consulting firm in Louisville, Ky. Danny brings to PCM his extensive experience with small business computers and applications software.)

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```
Files
FNEXT BAS
Ok

If files
SYSTEM VER 01.00.00
FORMAT
BACKUP SWG 2 BACKUP 2
153 K AVAILABLE DSKMOD 1
Ok

load "fnext"
Ok

list
10 CLG
10 PRINT "FOR-NEXT LOOP EXAMPLE"
FOR J = 1 TO 10
PRINT J, J
NEXT J
Ok
```


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The Disk/Video Interface also lets you enjoy a big 40-character by 25-line screen display on any TV. The larger screen is perfect for writing notes and reports or developing your own programs in BASIC. When accessing data by phone, you can read a full 25 lines of information without scrolling. And you can utilize all of Model 100's graphics characters.

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DIR also allows you to get information on a single file. This extended form of DIR is:

DIR pathname

I bet you were wondering when we were going to get to those pathnames you tried so hard to understand in MS-DOSsier Part I. Remember, a pathname is the entire path through levels of directories to a file. Our MS-DOS disk only has a single directory now, so the pathname need only be a filespec.

One of the files on every MS-DOS disk is "COMMAND.COM." Don't worry yourself with what it is now — for our purposes, it's just another file. To find out the size (how much disk space used) of this file and the last change date and time, we would enter:

DIR COMMAND.COM Press ENTER

DIR will only display information about the file you specified instead of all the files on the disk.

As with all MS-DOS commands, DIR will automatically act upon the default drive unless you specify otherwise. When you see "A>" as your MS-DOS prompt, the default drive is drive A:. To obtain a directory of drive B:, you would put the drive designation directly after the DIR command as in the following examples:

DIR B:
DIR B:/W
DIR B:COMMAND.COM /P

Remember, to change the default drive, simply type the drive letter followed by a colon and press ENTER. As an example, to change the default drive to B:, type:

B: Press ENTER

You can try it if you like. The new MS-DOS prompt will be "B>." To make our upcoming examples work properly, change the default back to A:,

Volume in drive A has no label
Directory of A:\

COMMAND	COM	15480	1-01-80	12:00a
DEBUG	COM	11764	2-01-83	10:13a
EXE2BIN	EXE	1649	2-01-83	9:19a
CHKDSK	COM	6330	2-01-83	9:16a
EDLIN	COM	4389	2-01-83	9:31a
PRINT	COM	3808	2-01-83	12:39p
RECOVER	COM	2277	2-01-83	2:22p
SYS	COM	850	2-01-83	2:26p
MORE	COM	4364	1-14-83	6:42p
DISKCOPY	COM	1419	2-14-83	4:39p
LINK	EXE	42330	4-01-83	2:21p
SORT	EXE	1216	2-08-83	7:04p
FIND	EXE	5796	1-14-83	6:35p
FC	EXE	2553	2-01-83	9:36a
COMPDUPE	COM	1704	1-01-80	12:29a
FORMAT	COM	5795	1-01-80	1:44a
ANSI	SYS	2138	1-01-80	1:47a
MAILLIST	BAS	13056	1-01-80	12:09a
GRAPHICS	BAS	9216	11-02-83	2:37p
CGPDMP	BIN	180	11-14-83	12:02p
BASIC	EXE	52064	1-01-80	12:04a
HFORMAT	COM	6291	1-19-84	12:10a
CONFIGHD	BAT	34	1-01-80	12:00a
		23 File(s)	458752 bytes free	

The Joker's Wild

This is a good time to bring up the subject of "wild cards." No, not the kind that has won (or lost) so many poker games for you, but similar in nature. Wildcards are used to replace all or part of a filename. The best way to explain wild cards is by a demonstration. Type the following command:

DIR *.COM Press ENTER
(Don't forget the period [.])

You should get a listing similar to that in Figure 3. Only the files with

extensions of ".COM" are displayed. The asterisk (*) tells MS-DOS "I don't care what goes here."

Try this:

DIR D*.* Press ENTER

As you can see, you can use the asterisks either in the filename or in the extension or both. The above example will give you a list of all files beginning with "D" such as "DISKCOPY.COM," and "DEBUG.COM."

The asterisks can take the place of many characters. To represent a single or certain number of "mystery" charac-

Volume in drive A has no label
Directory of A:\

COMMAND	COM	DEBUG	COM	EXE2BIN	EXE	CHKDSK	COM	EDLIN	COM
PRINT	COM	RECOVER	COM	SYS	COM	MORE	COM	DISKCOPY	COM
LINK	EXE	SORT	EXE	FIND	EXE	FC	EXE	COMPDUPE	COM
FORMAT	COM	ANSI	SYS	MAILLIST	BAS	GRAPHICS	BAS	CGPDMP	BIN
BASIC	EXE	HFORMAT	COM	CONFIGHD	BAT				
				23 File(s)				458752 bytes free	

ters, use the question mark (?). Try this example:

DIR*.?X? Press ENTER

This gives you a list of all files with any filename and an extension having "X" as the second character. This really isn't a practical example of using the question mark wildcard — and you very well may not see any practical uses of this wildcard now. You'll find, though, that as you use MS-DOS on a daily basis, you'll one day say to yourself "I wish I could . . ." and this wildcard will be the answer!

COPYing

In the second installment of MS-DOSsier, we made a copy of an entire disk. There are times when you'll need to copy a single file or a group of files to another disk. COPY is the MS-DOS command for this purpose. With COPY, you can copy everything from a single file to an entire disk (it's a very slow way to copy an entire disk).

We'll need to format a fresh disk to use for these examples. You should be an old pro at formatting by this time. If you need a little reassurance, refer to last month's MS-DOSsier.

Once formatted, put the new disk in drive B:. If you have only a single floppy disk drive, hold on to the new disk for now and leave your MS-DOS backup in the drive.

Type this command:

COPY A:FORMAT.COM B: Press ENTER

If you have a two-drive system, you'll see the drive-active lights flashing as the file named "FORMAT.COM" on drive A: is copied to drive B:. If you are using a single-drive system, MS-DOS will act as though you have a disk in drive A: and drive B: (even though you have no drive B:) and tell you to swap the disks periodically. At one moment, your floppy disk is drive A: — the next, it's B:. Doing enough of this disk swapping makes you realize the benefits of having more than one floppy disk drive.

The "A:" preceeding "FORMAT.COM" could have been omitted in the above example and MS-DOS would have defaulted to A:. (A: is the default drive.) The "B:," however, is mandatory because we are copying to a drive other than the default.

Wildcards can be very effectively used with COPY. Say, for instance, that you want to copy all your BASIC programs (which all have extensions of ".BAS")

Volume in drive A has no label
Directory of A:\

COMMAND	COM	15480	1-01-80	12:00a
DEBUG	COM	11764	2-01-83	10:13a
CHKDSK	COM	6330	2-01-83	9:16a
EDLIN	COM	4389	2-01-83	9:31a
PRINT	COM	3808	2-01-83	12:39p
RECOVER	COM	2277	2-01-83	2:22p
SYS	COM	850	2-01-83	2:26p
MORE	COM	4364	1-14-83	6:42p
DISKCOPY	COM	1419	2-14-83	4:39p
COMPDUPE	COM	1704	1-01-80	12:29a
FORMAT	COM	5795	1-01-80	1:44a
HFORMAT	COM	6291	1-19-84	12:10a
		12 File(s)	458752 bytes free	

from drive A: to Drive B:. You would type:

COPY *.BAD B: Press ENTER

Go ahead and try it. There should be a few BASIC programs on your MS-DOS disk to copy.

To see the results of what we just did, do a directory of drive B:. You should see "FORMAT.COM" along with a few ".BAS" programs.

COPY works in both directions. See if you can evaluate what this command will do and then try it:

COPY B:*.A: Press ENTER

Were you right? This command copies all the files on drive B: (*.A: is a "total wildcard meaning all files with any filename and any extension) to drive A:. Of course, the files were already on drive A:, but it copied over them.

Again, we could have omitted the "A:" in the above example, and COPY would have defaulted to drive A: for the same results.

In the examples so far, the copies of the files had the same names as the originals. It is possible and sometimes desirable to give the copy a different name. For example:

COPY A:DISKCOPY.COM B:
COPYDISK.COM Press ENTER

The file, "COPYDISK.COM" on B: will be an exact copy of "DISKCOPY.COM" on A: with a different name. Using this, it is possible to have more

than one copy of a file on a disk. Try this:

COPY A:DISKCOPY.COM A:
COPYDISK.COM Press ENTER

Take a look at the directory of drive A:. You'll have a new file, "COPYDISK.COM" that is an exact copy of "DISKCOPY.COM." MS-DOS will not let you copy a file onto itself by using the same "source" and "destination" names — there is no need to.

Get This Junk Off The Screen

No, that's not a valid MS-DOS command, but there is a counterpart — CLS. CLS is one of the simplest MS-DOS commands. There are no strange parameters to remember and no drive names to worry about. It just means "clear screen," and it does just that. It's really handy to make the screen a bit less confusing to view. Try it:

CLS Press ENTER

You may need to practice with this command for a while — it's pretty complicated!

You have enough ammunition here to begin seriously using MS-DOS, but we've only begun! There are many more useful commands that we'll be discovering next month. Even the very basic commands that we worked with today have other more advanced uses that we'll be taking a look at later in our journey through MS-DOSdom.

PCM

You can help your kids practice simple math calculations over summer vacation and familiarize them with your Model 100 as well. Just key in the 'Math Master' program listed here and let them . . .

Meet Professor PoCo

By Mel Perkins

Those Model 100 owners having elementary school-aged children, as I have, should be able to put this math tutor program to good use. It makes possible repetitive calculations in addition, subtraction, and multiplication from predetermined sets of numbers, with elapsed time.

To ready the program is very simple. For addition, you must create a *TEXT* file named *NUMS+.DO*. Similarly, *NUMS-.DO* is needed for subtraction; and *NUMSX.DO* is required for multiplication. All three, or any one or two, may be placed in RAM. These files may then, of course, be saved to tape or disk for future use, or to create additional files with different sets of numbers.

(Mel Perkins is an electrical engineer with Oklahoma Gas and Electric Co. He has been writing BASIC programs since he got his Model 100 more than a year ago.)

TEXT file setup is easy. Simply enter all numbers separated by commas. The first number entered is the top number of the problem, the second is the bottom number, the third is the top number of the second problem, the fourth is the bottom number of the second problem, etc. Needless to say, there must be an even number of numbers in each file. In the multiplication mode, no numbers larger than nine are allowed as the multiplier (bottom number).

Upon running the program, a menu is displayed from which you are asked to select addition, subtraction, or multiplication. If the text file corresponding to the selection is not in RAM, a "file not found" (FF) error results. When the selection is made, the first problem is displayed with the respective operating sign. Throughout the problem set, elapsed time is continuously displayed.

Entering the answer is done as you would actually do it on paper. That is

from right to left. Digits are entered over a question mark and displayed as the number is depressed on the keyboard. Backspacing will erase the digit just entered. ENTER will terminate the answer entry. No error correction is done at this time.

Upon completion of all problems, the screen will display the number of problems worked correctly, the number worked incorrectly, and the total time used. At this time you are congratulated for no errors, or you are asked to press ENTER to rework problems missed. Working missed problems is done in a similar manner as above with two exceptions: no elapsed time is shown and there is immediate error identification.

A file titled *RESULT.DO* is created and/or appended to monitor results. The file contains the dates the program was used, operation used, time used in minutes and seconds, and the number right and wrong.



The listing:

```
10 'MATH MASTER...      rev 3/31/84
20 MAXFILES=3:CLS
30 GOTO10000
100 CLS:OPEN"M.DO"FOROUTPUTAS2
110 T$(1)=TIME$:ST=1
120 IFEOF(1)THEN8000
130 INPUT#1,A,B:GOSUB600
140 IF VAL(TL$)=C THEN PRINT@210-N,SPACE
```

```
$ (15):NR=NR+1:GOTO120ELSE150
150 PRINT#2,A;"",B;"",":PRINT@210-N,SPACE
CE$(15):NW=NW+1:GOTO120
600 LA=LEN(STR$(A))
610 LB=LEN(STR$(B))
620 PRINT@100-LA+1,A
630 PRINT@140-LB+1,B
640 IF LA>LB THEN LL=LA ELSE LL=LB
650 LINE (127,35)-(127-LL*8,35)
660 IFAS$="1"THENC=A+B:PRINT@140-LB-2,"+"
"
670 IFAS$="2"THENC=A-B:PRINT@140-LB-2,"-"
"
```

```

675 IFAS$="3" THEN C=A*B:PRINT@140-LB-2,"x
"
680 LC=LEN(STR$(C))-1
690 N=0
700 PRINT@220-N,"?"
710 AN$(N)=INKEY$
720 IFST=1 THEN S(2)=TIME$:GOSUB7000
730 IFAN$(N)=" " THEN 710
740 IFAN$(0)=CHR$(13) THEN 710
750 IFAN$(N)=CHR$(8) THEN PRINT@220-N," ":
N=N-1:GOTO700
760 PRINT@220-N,AN$(N)
770 IFAN$(N)<>CHR$(13) THEN N=N+1:GOTO700
900 TL$=""
910 FOR NN=N-1 TO 0 STEP-1
920 TL$=TL$+AN$(NN)
930 NEXT NN
935 RETURN
7000 ' ELAPSED TIME
7005 S(3)=0:M(3)=0:H(3)=0
7010 FORCT=1 TO 2
7020 H(CT)=VAL(LEFT$(T$(CT),2))
7030 M(CT)=VAL(MID$(T$(CT),4,2))
7040 S(CT)=VAL(RIGHT$(T$(CT),2))
7050 NEXTCT
7060 IFS(1)=S(2) THEN 7070 ELSE IFS(2)>S(1) T
HENS(3)=S(2)-S(1) ELSE S(3)=(60-S(1))+S(2)
:M(3)=-1
7070 IFM(2)=M(1) THEN 7080 ELSE IFM(2)>M(1) T
HENM(3)=M(3)+(M(2)-M(1)) ELSE M(3)=M(3)+(6
0-M(1))+M(2):H(3)=-1
7080 IFH(2)=H(1) THEN 7085 ELSE IFH(2)>H(1) T
HENH(3)=H(3)+(H(2)-H(1)) ELSE H(3)=H(3)+(2
4-H(1))+H(2)
7085 PRINT@241,;
7090 IFH(3)>0 THEN PRINTH(3)"hour";:IFH(3)
>1 THEN PRINT"s ";
7100 IFM(3)>0 THEN PRINTM(3)"minute";:IFM(
3)>1 THEN PRINT"s ";
7110 IF S(3)>0 THEN PRINTS(3)"second";:IFS
(3)>1 THEN PRINT"s "
7120 RETURN
8000 RESULTS
8010 CLS:CLOSE
8020 PRINT@43,"NUMBER NUMBER"
8030 PRINT@83,"RIGHT WRONG"
8040 PRINT@164,NR:PRINT@172,NW
8050 PRINT@201,"TIME USED:"
8060 PRINT@241,M(3);" minutes ";S(3);" s
econds"
8070 OPEN"RESULT.DO"FORAPPENDAS3
8080 IFLEN(STR$(S(3)))=2 THEN SP$=" " ELSE
SP$=""
8090 PRINT#3,DATE$;"(";AS$;")";M(3);";";
S(3);SP$;NR;"RIGHT";" ";NW;"WRONG"
8100 IFNW=0 THEN PRINT@100,"NONE MISSED !"
:PRINT@140,"GOOD WORK !":KILL"M.DO":PRI
NT@0,;:END
8110 PRINT@100,"PRESS ENTER TO WORK"

```

```

8120 PRINT@140,"PROBLEMS MISSED";
8130 INPUTOU
9000 'REDO PROBLEMS MISSED
9010 CLS:OPEN"M.DO"FORINPUTAS1:ST=2
9020 PRINT@10,"PROBLEMS MISSED"
9030 LINE(58,8)-(150,8)
9040 IFEOF(1) THEN CLOSE:KILL"RAM:M.DO":CL
S:MAXFILES=1:END
9050 INPUT#1,A,B:GOSUB600
9060 IF VAL(TL$)=C THEN PRINT@82,"GOOD!":
PRINT@210-N,SPACE$(15):GOTO9040
9070 PRINT@82,"WRONG":PRINT@210-N,SPACE$
(15):GOSUB600:GOTO9060
9080 GOSUB900
10000 'ADD/SUB SELECT
10010 CLS
10020 PRINT@52,"MATH MASTER"
10030 PRINT@132,"1 ADDITION"
10040 PRINT@172,"2 SUBTRACTION"
10045 PRINT@212,"3 MULTIPLICATION"
10050 PRINT@292,"Select";
10060 AS$=INKEY$:IFAS$=" " THEN 10060
10080 IFAS$="1" THEN OPEN"NUMS+.DO"FORINPU
TAS1:GOTO100
10090 IFAS$="2" THEN OPEN"NUMS-.DO"FORINPU
TAS1:GOTO100
10100 IFAS$="3" THEN OPEN"NUMSX.DO"FORINPU
TAS1:GOTO100
10200 GOTO10060

```

PCM



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More On Variables

By Richard A. White
PCM Contributing Editor

Model 100 BASIC supports four types of variables. String variables hold characters or strings of characters. There are three types of real or numeric variables. BASIC constructs variable tables to keep data about active variables. In the case of numeric variables, the value of the variable is kept with the characters that define the variable. In the case of character strings, the strings themselves are stored in the CLEARED string space with the starting address and length of each string kept in the variable table. The variable table entries for strings use memory space in addition to the space used by the character string. Fire up the M100 and let's see how much.

```
100 PRINT FRE(0) "FRE("): AS=
"TEST": PRINT FRE(0) "
FRE(")
```

When you RUN the above line of code, you will get something like this:

```
18016 256
18010 256
```

The manual tells us that FRE(0) will return the amount of numeric memory available so 18016 in a 24K machine is reasonable. Programs and .DO files in memory take up the rest. FRE("") returns the amount of unused string space which defaults to 256 when you first enter BASIC. Now the second set of numbers shows that something is different than we might expect. 18010 makes some sense since the variable table entry takes up space in the numeric memory. If the M100 is your first machine, you would have no way of knowing this from the manual. But, we get 256 again!

Where did the word TEST go? It's apparently not in cleared string space. It's unlikely that the characters follow the variable table reference, but we can test that.

```
150 PRINT FRE(0) "FRE("): AS=
"TEST OF A LONG STRING"
:PRINT FRE(0) "FRE("): END
```

Now RUN 150.

```
17949 256
17943 256
```

The amount of numeric memory has changed since we used some for Line 150 in the BASIC program. Six bytes were used for the AS variable table entry as before which now is clearly an entry with address and length of the string and cannot contain the string itself. The string is not in string space or else FRE("") is telling a big fib. The cry "Where's The String?" resounds with "Where's The Beef?!" (Sorry, but I couldn't resist.)

Still, it is a crucial question. I will now open the sealed envelope that has been kept in the birdhouse behind the Post Office in Prospect, Ky. The answer is "It's in the BASIC Program." There is every reason not to move a string defined in a line of BASIC anywhere else. That string is going to exist as long as the BASIC program exists. We don't want to waste valuable memory by duplicating it in string space. And the variable table entry points to the location within the program.

However, if strings that are defined in a program are combined, the new string that results must be put into string space.

Dick White has been programming in BASIC for over three years, and has a number of programs on the market for the Color Computer. He is also a columnist for the Rainbow, PCM's sister publication, and is a member of CINTUG, the Cincinnati TRS-80 Users' Group.

```
200 PRINT FRE(0) "FRE("): A$=
"TEST OF A LONG STRING"
210 B$="THIS IS A ":C$=B$+A$
:PRINT FRE(0) "FRE("): END
```

When I RUN this fragment, I get the following:

```
17856 256
17838 225
```

We defined three strings so 18 bytes were allocated for variable storage. Thirty-one bytes of the CLEARED string space were used for what I count as a 30-byte string. Where is the string C\$ in memory? That depends on what files you now have in your machine and what files you have deleted in the past. Remove the END from Line 310 and add Line 320 to read the string along with some of the other files and some garbage in memory.

```
320 FOR X=HIMEM-2500 TO
HIMEM: PRINTCHR$(PEEK(X));
:NEXT
```

The above piece prints any printable character saved between 2500 bytes below the top of available memory (HIMEM) and HIMEM. You could add instructions to PRINT X and PRINT PEEK(X) to track memory locations and their numeric contents. If your machine is fairly full of .DO files you may need to look much lower in memory.

All characters entered from the keyboard into string variables are stored in CLEARED memory space. You will need to CLEAR adequate string space for this input. You cannot use all the memory reported by FRE(0). We have seen that some goes to the program, some goes to the variable table entries and a little must also be reserved for the microprocessor stack.

Another string variable issue we need to discuss goes by the glorious name of "garbage collection." If we had in another line C\$=B\$+"NEW TEXT", BASIC would write THIS IS A NEW TEXT to an unused part of the string space and put the new length and address data under the C\$ listing in the variable table. The old C\$ string is still in the string space, but reference to it in the variable table is gone. After a while, new string entries will fill up string space even though it contains some "lost" strings. At that point, M100 stops to "collect the garbage." Strings listed in the variable table are rewritten over unlisted space moving the free space to the end of string space. This may take a few seconds during which the computer

seems to go dead, but it is only cleaning house.

As previously noted, there are three kinds of numeric variables: integer, single precision, and double precision. Integers take up two bytes of memory plus the variable table reference.

```
10 ?FRE(0): X%=31000:
?FRE(0): END
```

In my machine, this produced the numbers 17887 and 17882 showing three bytes were consumed by the variable table reference and two by the value itself.

The '%' told BASIC that X% was an integer variable. You could define a different variable X=200 that would be a double precision variable. Each time you mean for the program to use the

“. . . if there is no tag declarator or DEF statement, BASIC assumes the variable to be a double precision number.”

integer 'X' variable you need to tell the program by writing 'X%'. Alternately, you can define certain variables to be of a certain type at the beginning of the program. Then you can use those variables without the type declarator tags like '#', '%', '!' and '\$'. For example, if I use DEFINT X, J-N at the start of the program, then the BASIC assumes the type to be integer for X, and all variables that start with the letters J through N. Without the DEFINT statement BASIC assumes these variables to be double precision.

Now about this precision stuff. Double precision numbers may consist of up to 14 significant digits plus the decimal point. Eight bytes are necessary to store the number and the variable table uses another three to keep the variable reference. In addition, computations with double precision are very slow because BASIC must use very complicated floating point decimal routines. Using single

precision helps some if you can live with only six significant figures. Total storage is reduced to seven bytes from 11 bytes. Computation is a tad faster than double precision, but is still three times slower than integer math. The declarator tags are '#' for double precision and '!' for single precision. Definition statements are DEFDBL and DEFSGN.

We have routinely used string variables with the '\$' declarator tag. It is also possible to define variables with DEFSTR and dispense with the '\$' for those variables in the program.

To summarize, if there is no tag declarator or DEF statement, BASIC assumes the variable to be a double precision number. One of the DEF statements, DEFSTR, DEFSGN, DEFINT or DEFDBL define variables to be of the particular type whenever used without declarator tags in the BASIC. When a variable is used with a declarator tag, (\$, %, !, or #), a new variable of the specified type is established. For example, if X=1000 is double precision by default, X\$="EXAMPLE" establishes a second variable which is string type and both variables are available to the program.

Let's come back for a moment to variable names. You may use any letter combination for a variable except those containing a reserved word. What is a reserved word? It is one that is also a BASIC statement or function command. ON, TO, GO and DEF are examples. When the computer encounters an ON, it starts looking for a variable representing a number to use in a following GOSUB, GOTO or other action. If your statement had been "ON=20", no variable comes next, the computer gets confused and registers a complaint as a syntax error.

You are allowed to use whole words as variables, but we now know how the variable table works and that only the first two letters are used. The objective is to allow writing clearer programs, but there are drawbacks that keep people from using the capability. First, there is the added memory used, one byte for each added letter each time the variable is used. Secondly, the number of reserved words (BASIC commands — remember?) become much more numerous. Last is the trouble in devising meaningful words which always are different from any other in the first two letters. If I had two FOR-TO-NEXT loops, one within the other, I might like to name the variable in the outer loop COUNTONE% and the inner loop variable COUNTTWO%. Since the first two letters are the same, the computer cannot tell the difference

and the loops won't work the way you expect. So, we will try `ONECOUNT%` and `TWOCOUNT%` instead. The first two letters are different, but `ONECOUNT%` contains `ON`, a reserved word and `SN Error` results. Another loser is `TWO-COUNT%`. The computer sees it as `TW-CO` without a variable to assign the result or the equal sign — `SN Error`.

Both real and string variables can be viewed as either global or local. Actually, `BASIC` variables are always global since they can be used anywhere in a `BASIC` program. In languages like `PASCAL`, `C` and `BASIC09`, variables have a value only in the particular subroutines or procedures where they are declared. Further, the variable 'X' in one procedure is a different variable from the variable 'X' in a different procedure. We cannot define our variables like this in `BASIC`, but we can view how we use them as local or global. In a file program, the variables that refer to the data records are used as global in that they are defined in the input section, changed in the editor, saved in another section to tape or disk, used in search and sort sections and in various subroutines. A variable used in a `FOR-TO-NEXT` loop in a subroutine means nothing when you exit that subroutine and may be

reused elsewhere.

There is a savings of memory if certain variable names are pre-chosen and used only for local purposes. They can be redefined and used again and again in other parts of the program. This serves to help clarify the program if it is known that 'J' and 'K' are always used locally, generally serve counting purposes and never have meaning once the using routine is left. This will work well with some careful discipline and I think is much better than trying to find an unused variable each time a short loop is needed. Here is an obvious place to define these variables with `DEFINT J,K` to speed the loop action and save a few memory bytes. You should also define string variables and other real variables for local temporary data holding purposes. Just make sure all local variables are defined when they are first used in the routine and do not contain data needed elsewhere when the routine is exited.

Numbers and strings may also be kept in subscripted or array variables. Here, one array name is used to refer to a series of data items. For example `A(1)=23, A(2)=45 . . . A(20)=14`. `BASIC` then sets up a separate portion of the variable table in memory for array vari-

able entries. The key thing to know is that the variable reference is only needed once at the head of the table. After that only the number of bytes to actually store the number or string location and length for each entry are needed.

When a subscripted variable is first used, an 11-entry block is established in the variable table for that variable. Note that `A(0)` or `AS(0)` are members of an array. If you need more entries, you must dimension the variable, e.g., `DIM AS(100)` or `DIM AS(X)`. You can also have multi-dimensioned arrays. `AS` could be dimensioned `DIM AS(50,10)`. Note that such arrays use considerable memory space. Finally, if you know you are only going to use a few members of an array, say four or five, then dimension the array, say, `DIM AS(5)`, to keep memory use to only what you really need.

Arrays are most useful where the program itself must choose which data item to use. You are permitted and even encouraged to use a variable within the parentheses (`AS(X)`) so that a number determined by the program selects the desired array member. Some good examples of array usage have appeared in recent issues of `PCM's` sister magazine, `THE RAINBOW`.

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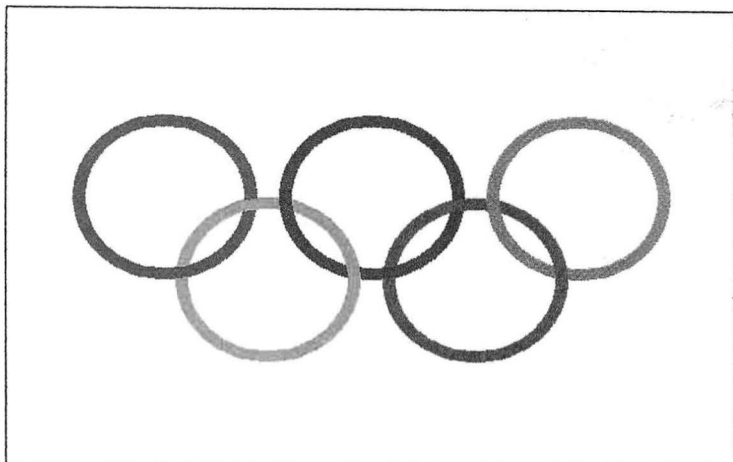
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Flag of the Month Club

By Wayne Sanders



1984 will be remembered as the year of Michael Jackson, Indiana Jones, Boy George, Gremlins, the Model 2000, George Orwell, a presidential election, break dancing and the 1984 Olympic Games. This month's flag

honors the Winter Games in Sarajevo and the Summer Games beginning this month in Los Angeles.

This program beautifully reproduces the Olympic Flag on the monitor of a color-equipped 256K Model 2000. It can be printed on a CGP-220 ink jet printer

by changing the first line to read:

1000 SP=1

You must have *CGPDMP.BIN* on your disk and enter BASIC using the following MS-DOS command line:

BASIC /M:&HFF00

The listing:

```
1000 SP=0
1010 IF SP THEN CGPDMP=&HFF00: BLOAD "CGPDMP.BIN", CGPDMP
1020 SCREEN 3: PALETTE 1, 4: PALETTE 2, 2: PALETTE 3, 6: PALETTE 4, 1: PALETTE 5, 5: PALETTE 6, 3: PALETTE 7, 7
1030 CLS: KEY OFF
1040 DEGREE=1.745329E-02
1050 LINE (1,1)-(638,398), 7, BF
1060 CIRCLE (140,164), 70, 4
1070 CIRCLE (140,164), 80, 4
1080 PAINT ( 65,164), 4, 4
1090 CIRCLE (320,164), 70, 0
1100 CIRCLE (320,164), 80, 0
1110 PAINT (245,164), 0, 0
1120 CIRCLE (500,164), 70, 1
1130 CIRCLE (500,164), 80, 1
1140 PAINT (425,164), 1, 1
1150 CIRCLE (230,236), 70, 3
1160 CIRCLE (230,236), 80, 3
1170 PAINT (155,236), 3, 3
1180 CIRCLE (410,236), 70, 2
1190 CIRCLE (410,236), 80, 2
1200 PAINT (335,236), 2, 2
1210 CIRCLE (140,164), 70, 4, 225*DEGREE, 315*DEGREE
1220 CIRCLE (140,164), 80, 4, 225*DEGREE, 315*DEGREE
1230 PAINT (155,230), 4, 4
1240 CIRCLE (320,164), 70, 0, 135*DEGREE, 225*DEGREE
1250 CIRCLE (320,164), 80, 0, 135*DEGREE, 225*DEGREE
1260 PAINT (245,170), 0, 0
1270 CIRCLE (320,164), 70, 0, 270*DEGREE, 315*DEGREE
1280 CIRCLE (320,164), 80, 0, 270*DEGREE, 315*DEGREE
1290 PAINT (335,230), 0, 0
1300 CIRCLE (500,164), 70, 1, 135*DEGREE, 225*DEGREE
1310 CIRCLE (500,164), 80, 1, 135*DEGREE, 225*DEGREE
1320 PAINT (425,170), 1, 1
1330 IF SP THEN CALL CGPDMP(ER%)
1340 GOTO 1340
```

PCM

Soapbox Time For Telecommunicators

By Randy Graham

For the past few months, we have been on a familiarization tour of some of the information services you can access with your PoCo's *TELCOM* application. Let's pause in that tour for a moment to look at a lively topic in the field. Yes, friends, it's soapbox time.

Shut The Door!

Let's talk about security — everyone else is. I have read a lot of misinformation on the subject, especially in the popular press from writers who are still intimidated by computers. And as I write this, "Wargames" is running on cable TV and many people are asking, "Could anything like this really happen?" OK, I want my turn, building on things we have talked about.

First, let's claim the field. Computer security is the exclusive concern of telecommunicators. If you want to protect a computer, lock the door. If you do not, someone may steal your computer, software and/or files. My only complaint about the PoCo is that it can be too portable.

If you have a mini- or mainframe with terminals scattered around the building, lock the building. You are then vulnerable only to crooked employees practicing electronic chicanery, just like the very small number of bank employees who embezzle from inside the organization. It is only when you put your system online that the question of legitimate access versus privacy from intrusion becomes an issue.

(Randy Graham is a rehabilitation counselor working with the handicapped. Personal computing is his hobby; telecommunications one of his favorite activities. He has done freelance information retrieval and is an inveterate user of the major online systems.)

Two true statements: a system can be made secure; any code can be broken. It is a compromise between safety and convenience — how big a lock to put on your front door; how big a lock to put on a bank vault. If a computer system's security is too complex, users grumble and look for short cuts. If it is too easy, people drop in, wander around and sometimes steal stuff. The current practice is to make security proportionate to value. As a telecommunicator, you will have to participate in this system.

You may have found that some bulletin boards are using passwords. This is to get personal data on you to help protect the system against vandals who will try — and succeed — in breaking into the bulletin board program itself and messing it up. Nothing much of value is lost except the sysop's time to clean it up and put it back online. If you give your password to a friend, nothing bad is likely to happen.

Commercial information services routinely use a combination of account number and password. On many of them, you can change your password at will. These password files are locked to even the system operators. I used to worry about how I could guess a password that was unique among all the hundreds of thousands of users. The answer is that others may use the same password; it is the combination of my account number and my password that is unique in the system.

The account number is public. It is used by the service for billing and by other users for direct messages. It is visible everywhere. Suppose someone tried to logon with my ID and guess my password. If I use a common one like my name and he guesses it, that person will have access to my files and unrestricted use of the service, with the bill

going to me. But that is not easy. Most services let you try three times and then disconnect. If you keep calling back, using an iterative search, a bell rings somewhere and an operator will call me to ask if I am having problems. If I say no, or do not answer, or am online when someone else tries to use my number, security is alerted.

Suppose I lose my password or forget it. Can I call the 800 number and get it? No, the operator will tell you he/she does not have access to it. And how does he/she know it is me, even if I give my name, address, phone number, Social Security number and account number? All these records are all too public now. What the operator will do is lock my account by generating a new password. This password will be sent to me by first class mail to the address of record of the account. I lose access to the system for a few days for my carelessness. Same if I report that I think my password has been compromised.

But what if a weird friend plays a practical joke by calling in my name and getting my account locked up? Each system has a way to deal with this. The Source asked me my mother's maiden name when I subscribed. Unless I remember this, they will not accept my request for a new password. CompuServe calls back to the phone number of record for verification.

The point of all this is that the information service systems are secure enough to protect the privacy and integrity of your personal files. The most vulnerable point of attack for the electronic burglar is your password and you have that under your exclusive control. All we have to fear is laziness and stupidity.

You don't believe me. Go to any terminal where the user has to use access codes. The codes will be taped to the

terminal itself or to the desk slide. Remember the kid in "Wargames" getting the school's password that way? That was real.

As PoCoers, we face a particular form of this temptation. Do not use the autologon capability to include your password. It is too easy for someone to pick up your PoCo, call the file and learn the passwords. Do not put your passwords in a separate text file for the same reason. Do not think that if you have made this file invisible on the menu, you are safe; too many people know how to strip off the invisibility cloak. Do not write your passwords on a card you keep in PoCo's case so that they will always be convenient.

Well then, what can you do? If you can choose your password, get one that you can always recall without effort that is not your name, address, etc. How about your spouse's middle name and birthday? Do you remember the street address of the house where you grew up? If you have a good password, use it on as many services as possible so that you have fewer to remember. Don't change it unless it is compromised; changing frequently as recommended means promotes confusion and tempts you to write down the current ones. If

you cannot choose your own password, try to scramble it somehow. If you have to keep a list because you have so many passwords or do not use them often enough to remember, use mnemonics.

If you come to see me, you will see a little booklet in plain view, like I told you not to do. In it are all my logon numbers and protocols. But for passwords, you will find things like "HOME," "LIBRARY," and other things that are not the passwords. You will not be able to use my Dow Jones password because it is not long enough, and I will give you a free clue: Dialog passwords contain no blanks.

Do not give your passwords to anyone. Do not loan it to a friend to do just a little search and he will pay you for the connect time. You know your friend, but do you know all of your friend's friends to whom he might give it — just for fun? When showing off your databases, ask the person to look away as you type in the password; I routinely do this when I am demonstrating.

No one on the system ever needs your password. CompuServe had a spell of trouble a while back. When you were chatting with a "friend" online, he would say, "Give me your ID and password so that I can send you EMail." Wrong.

Passwords are not needed for EMail or messages. Then there was the wrinkle where while you were chatting with this new "friend," your screen would say, "Dropped by host — re-enter ID and password." This system error message was sent by your "friend."

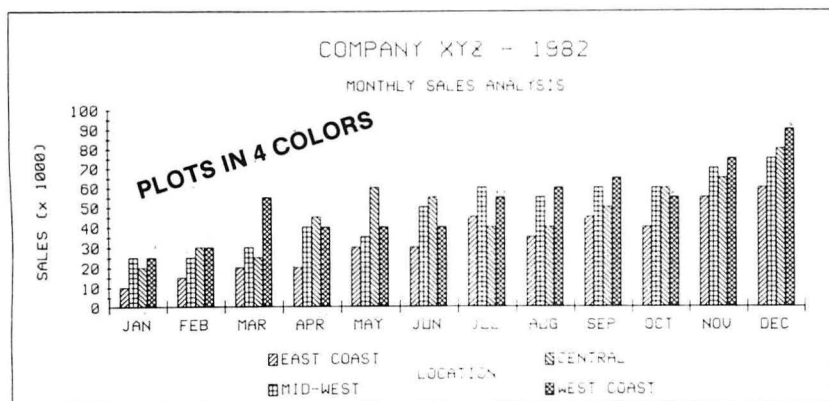
What difference does it make to you as a telecommunicator? The security of your files and your credit card is in your hands. Nobody loves a peeping Tom, and the most elementary defense is to draw your shades. If you leave your keys in your ignition, it is still a crime to steal your car, but do not expect much sympathy. You can install a deadbolt on your door that sends steel rods into the framework of the house, but if you leave the key under the mat, your house is not very secure — especially if you leave a note on the door saying, "Joe: key under mat; go on in and ice down the beer." So, draw your blinds, lock the door, don't flash a wad of currency, and keep your passwords in your head.

Okay, down off the soapbox. Next time we go back to our tour of information utilities. Meanwhile, give me your feedback and practice your telecommunications by sending me some Email on CompuServe (70015,434), The Source (BCF042) or MCI Mail (RGRAHAM).

PCM

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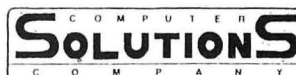
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SOFTWARE

New 'Spreadsheet' Tidy, Impressive

By Dr. Laurence D. Preble

I work with five personal computers. The Radio Shack Model 100 is my favorite. Technically speaking, the M100 is not the most powerful or fastest personal computer I own. But practically speaking, it is the most useful computer I own because of its extreme portability. It goes everywhere with me and acts as a liaison with my office computer. Furthermore, I see an increasing quantity and quality of business software becoming available for the M100. The apparent limitations of memory and small display screen size have left software manufacturers undaunted as they scramble for more and better M100 programs.

I was delighted when American Micro Products, Inc. released their *TPLAN/NPLAN* Spread Sheet program for the RS Model 100 and the NEC PC-8201A. Unfortunately, I have no access to a PC-8201A. I am told, however, that the functions and features on the two versions of the spreadsheet are identical. My 32K M100 became, therefore, the defacto test bed for *TPLAN/NPLAN*.

The first and most famous spreadsheet program for personal computers was *VisiCalc*[™], introduced in the late 70's. *VisiCalc* was such an instant success that other software houses acted quickly to make look-alike spreadsheet programs for the majority of business and many home microcomputers on the market. Most spreadsheet programs are huge. They gobble large amounts of memory and require frequent disk access. *TPLAN/NPLAN* had no choice but to be smaller. The strong points of the M100 and the 8201A do not include megabytes of RAM and Disk. *TPLAN/NPLAN* is provided on cassette and can create a maximum spreadsheet size of 90 rows by 26 columns. The actual size will depend on the requirements of each individual spreadsheet generated as well as the amount of memory available on your computer.

It is not within the scope of this review to explain all of the complexities behind computerized spreadsheet analysis. Check the computer science section of your local bookstore for volumes of information on the topic. Here are the basics:

TPLAN/NPLAN, like *VisiCalc*, is an electronic analog of a paper spreadsheet. In the past, accounts and engineers would use huge sheets of ruled graph paper to list rows and columns of data. Each row or column of data could be headed by a descriptive label. Some of the rows and columns would contain calculations based on the spreadsheet data. The calculations could be as simple as a tally or as complex as a Fourier Transform.

A paper spreadsheet could be created to track monthly budget expenditures. Labels across the top of the sheet could indicate the months of a year while labels for each row could describe each expenditure. A series of tallies would be found at the bottom of the page.

Another paper spreadsheet could be designed to keep track of a company's or an individual's financial statement: assets and liabilities. The bottom of the sheet could show a calculation indicating net worth. The possibilities are only limited by your imagination and ingenuity. Get the picture?

Example

	Monthly Production of Widgets							
	JAN	FEB	MAR	APR				
BOLTS	3	+	4	+	5	+	6	= 18
	+		+		+			
NUTS	4	+	5	+	6	+	7	= 22
	+		+		+			
CRTS	5	+	6	+	7	+	8	= 26
	+		+		+			
QBERTS	6	+	7	+	8	+	9	= 30
	—		—		—		—	
	18		22		26		30	

This sample paper spreadsheet keeps track of NUTS, BOLTS, CRTS and QBERTS manufactured over the months of JAN, FEB, MAR and APR. The tallies at the bottom show the total number of all items manufactured in a given month. The tallies off to the right side show the total number of single items manufactured JAN through APR.

An electronic spreadsheet does everything a paper spreadsheet does and more. Rows and columns can be filled with data. Descriptive Labels are okay too. But most importantly, the rows and columns can also be made to hold mathematical formulae which automatically do calculations on the data. The computer takes all the drudgery out of spreadsheet analysis.

For example, add an item to the growing list of monthly products and the tally at the bottom automatically adjusts to reflect the change.

Unfortunately, the screen on a Model 100 is not nearly big enough to show a complete spreadsheet of any reasonable size. Not to worry, a feature common to all electronic spreadsheets allows you to treat the screen like a movable window. The window can be moved to any portion of the spreadsheet allowing you to view any part of it at any given time. When desired, the entire spreadsheet may be output to a printer or saved in a data file.

TPLAN/NPLAN

I was first struck by the impressive packaging of the AMPI software. *TPLAN/NPLAN* is provided in a notebook style, moisture resistant plastic container. When closed, the package resists an accidental coffee spill or even a momentary encounter with Spring weather. Opening the cover reveals an attractively bound instruction manual. The software is on cassette tape under the manual in a foam padded enclosure. *NPLAN* for the NEC PC-8201A is on side A of the tape. *TPLAN* for the

Model 100 is on side B.

The instruction manual is logical and concise. A table of contents and an index are included. A person with at least passing familiarity with electronic spreadsheet analysis should have no trouble following the documentation provided. A total beginner will need to study and experiment a little before making his own spreadsheets; however, prefabricated spreadsheets (templates) are available for a variety of applications from AMPI. Even a rank beginner would have no difficulty using one of the canned templates.

TPLAN or *NPLAN* loads into the computer like any BASIC program. Be prepared to wait a minute or so. The software is complex and fairly large. The tokenized BASIC program takes up 13,420 bytes in my computer.

When you RUN *TPLAN* or *NPLAN*, a main program menu appears:

MAIN PROGRAM MENU

1 = Set up 5 = Print
2 = Edit 6 = Compute
3 = Save 7 = Calculator
4 = Load 8 = Computer Menu
Please make your selection?

Use the set up function to tell the computer how big your spreadsheet can be. It asks for the maximum number of rows and columns.

Use EDIT to create or modify a spreadsheet. Function keys available in EDIT are jmp, vin, out, fil and hlp. The jmp, or JUMP, key positions the cursor anywhere on the spreadsheet. The vin, or VIEWIN, key displays input data in its entirety at any spreadsheet position. The out, or OUTPUT, key displays computed output data at any location. The fil, or FILL, key allows data entry at any spreadsheet location. The hlp, or HELP, key displays another menu: Sel: 1=Pgm Menu 2=Ins 3=Del 4=Repl? These stand for Return to Program Menu, Insert, Delete and Replicate.

I was impressed by *TPLAN/NPLAN*'s ability to replicate in a relative manner. This is a big spreadsheet function — very powerful! The only other M100 spreadsheet I have seen did not include the relative replicate function. Relative replicate is used to transfer formulae into new cells in an interpreted form. For example, suppose the first row in a spreadsheet is:

	A	B	C	D	E
1	:	3	4	5	6 +A01+B01+C01+D01

The formula under column E tells the computer to add up each datum at row 1, columns A through D. The result would be displayed when you output the spreadsheet. Now add another line:

	A	B	C	D	E
1	:	3	4	5	6 +A01+B01+C01+D01
2	:	4	5	6	7 +A02+B02+C02+D02

Notice that the formula at the end now refers to A02 instead of A01, B02 instead of B01 and so on. Well, by relative replication, we could add a third line formula which would refer to A03 and B03 and so on. The automatic process of relative replication can obviate a long typing session.

Relative replication is only useful for formulae. Data must be entered one by one.

Besides addition, multiplication, subtraction and division, *TPLAN/NPLAN* supports various non-BASIC formulae including transcendental functions, minimum/maximum value functions, percentage and averaging functions.

Save, Load And Print

Use the SAVE function to output your spreadsheet model to either cassette or a RAM file. (A spreadsheet model or template refers to the table of data and formulae which make up the spreadsheet prior to doing the calculations on the data.)

The load command allows you to input a previously saved spreadsheet template.

The Print Command allows you to print either the spreadsheet template or the finished product, a spreadsheet where all calculations have been performed.

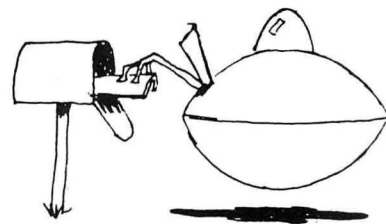
Compute, Calculator And Menu

This command causes the spreadsheet model to spring into action, all calculations are performed, results are tabulated.

A full function calculator program is available during your spreadsheet construction. This is very handy. It is not unusual to see a programmer sitting in front of a very expensive computer terminal doing some esoteric task; meanwhile, he interrupts himself to reach for a pocket calculator to add a couple of figures! The fact is that most software applications will not allow you to break to do some simple arithmetic. *TPLAN/NPLAN* is a notable exception.

Select the computer menu function to exit *TPLAN/NPLAN* and return you to the MODEL 100's main menu.

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Conclusions

TPLAN/NPLAN will not allow you to produce huge memory hogging financial models; it is, however, more than adequate for more mundane usage. Best, of all, you can model to your heart's content anywhere on earth — or at sea or in the air! I used one of AMPI's business templates, a preprogrammed spreadsheet model, to produce a personal balance sheet for a Savings and Loan. The results were very tidy and seemed to impress the mortgage lenders.

As a footnote, our new home mortgage was approved!

(American Micro Products, Inc., 705 N. Bowser, Suite 125, Richardson, TX 75080, \$99.95)

SOFTWARE

AUTOPEN Programs Cram Big Features In Small K

If you've had time to get acquainted with your Model 100, you've discovered, as I have, that the built-in *TEXT* processor is limited in its abilities to format for printing the text prepared on your Portable Computer.

Tandy apparently intended that the Model 100 be used to enter and edit text and then transfer the text to another computer with a full-featured word processing program to do the formatting and printing.

Since I travel a great deal, I've found that the Model 100 is great for making constructive use of my travel time by typing notes and letters while the previous meeting is still fresh in my memory. (No hassle from any airlines while using my PoCo on board yet.) I often stop at a friendly Radio Shack store or Computer Center to use their printers to print this text while I'm traveling. However, since the only formatting control built into the Model 100 is line width, I could not prepare a finished, formatted letter without transferring the document to my IBM PC or Color Computer to format the letter and print it, or by handing the rough copy to my secretary for retyping when I returned to the office.

Well, I'm pleased to report that things have gotten better for my secretary and for me, too. I can now format my letters on my Model 100 and print final copies without having to transfer the files to another computer or my secretary be-

cause I now have a copy of *AUTOPEN*, the new word processor from Chattanooga Systems Associates, the folks who brought you the *SCRIBE* word processing program for the Model 100.

What *AUTOPEN* does is format and print files created by the *TEXT* program in final presentation form. While all the features available on my business and home computers are not included in *AUTOPEN*, it is amazing what Chattanooga has crammed into a 2K program.

With *AUTOPEN* you can:

— Select the type size and corresponding standard letter formats. Available choices are:

	Char/In	Margins	Line length
PICA	10	10	64
ELITE	12	12	76
MICRO	17	18	108

These preset parameters may be reset to other values using commands embedded in the text. (More on this later.)

— Set up your printer for:

- Normal printing; high speed data processing print mode for dot matrix printers or daisy wheel printers.
- Double Strike mode for dot matrix printers which support this mode.
- Emphasized mode for dot matrix printers which support this mode.

— Print from a file:

- Contained in RAM as a document (.DO).
- Stored on cassette. Input from tape is read and printed one line at a time and not stored in memory. Therefore, it is possible to print a file that is too long to have both the file and *AUTOPEN* in memory at the same time.
- Typed in from the keyboard using *AUTOPEN* as a buffered typewriter. This is useful when typing small tasks such as an envelope.

— Determine line spacing. The default is single spacing; however, any amount of spacing between lines can be accommodated.

— Specify page numbering if desired.

— Print multiple copies of the same document.

— Specify continuous tractor feed or single sheet paper so the printer will stop at the end of the page and wait while you change the paper if you are using single sheets.

Imbedded commands can be inserted

in the text to gain additional control of the printing format: Imbedded commands are commands typed in the document which control the printed format but are not printed. Using these commands, you can control:

- Top margin size
- Bottom margin size
- Left margin
- Line length
- Number of spaces indented
- Centering lines of text
- Skipping lines
- Headings on specified pages
- Where a new line starts
- Where a new page starts
- Where a document stops for keyboard input
- Right justification on or off
- Double width on or off
- Any other printer commands unique to your printer

For those of you with previous *SCRIBE* versions, this may sound pretty familiar. What is different about *AUTOPEN*?

Three new embedded commands were added to:

- Print the current filename, date and time at the bottom of each page.
- Allow chain printing of text files.
- Perform hanging indent of formatted text with numbered paragraphs or of set items.

AUTOPEN also corrected a few minor bugs and allowed the use of lowercase letters in prompts. You can also skip the formatting prompts if you want to use the preset defaults.

Purchasers of previous versions of *SCRIBE* may obtain a copy of *AUTOPEN* by sending \$5 and the original tape to CSA.

As I said before, this is quite a powerful program considering its compact size. The only drawback is its speed of printing. Typically, *AUTOPEN* prints unjustified text at about 25 to 50 characters per second when not limited by the printer capability.

For those requiring additional capabilities in the mailing area, another version of *AUTOPEN* is available, *AUTOPEN N&A*.

AUTOPEN N&A fully incorporates all the features of *AUTOPEN* and includes additional features to print single width mailing labels; address envelopes; print names, addresses and salutations in form letters; and print address file listings. It includes a data management system compatible with the Model 100's

built-in *ADDRSS* and *TELCOM* programs. Because of the additional features, it requires about 5.2K of RAM.

AUTOPEN has solved the major problem I had with my PoCo. If you do a lot of correspondence with your Model 100, I highly recommend it.

(Chattanooga Systems Associates, P.O. Box 22261, Chattanooga, TN 37422. *AUTOPEN*, \$29.50 & \$2 S/H, *AUTOPEN N&A*, \$39.50 \$2 S/H)

— Bruce Rothermel

SOFTWARE

Traveling Sales Manager Has On-The-Road Ease

Traveling Sales Manager, one of a small handful of programs for the Model 100 available from Traveling Software, is a handy, easy-to-use program which could be quite useful to someone who spends a lot of time on the road selling products and services. It has a number of design flaws which make it fall somewhat short of the program it could have been, but no shortcoming so significant that you shouldn't consider buying it if it meets your needs.

Essentially, *Traveling Sales Manager* (*TSM* for short) allows you to keep track of your customers, orders and follow-up appointments and to produce some useful printed reports, all with a fair amount of ease and a minimum of key-stroking. The program takes full advantage of the M100's function keys to simplify data entry and program operation.

One of the strongest features of this program is the documentation which accompanies it. I spend a lot of time analyzing software for myself, clients and magazines, and I've been a professional technical writer for a few years, so I tend to be pretty harsh about documentation. Traveling Software has done an excellent job of meeting users' needs with its 100-plus-page manual and audio tutorial tape. In fact, the audio tape is one of the niftiest ideas I've seen in my entire professional writing career. The tape introduces a chap named "The Traveling Professor" who has a voice slightly reminiscent of a reedy Professor Kingsfield of TV's *Paper Chase* fame. With light classical music wafting in the background, the user gets

a quick but relatively thorough overview of the product from the professor in a droll manner. As someone who has used computers for something like 10 years and the Model 100 for six months (quite heavily), I found the tape unnecessary. But it seems to contain a great deal of information — presented in an entertaining and refreshing way — for first-time users.

There are actually four programs on the tape you buy from Traveling Software when you order *TSM*. These programs are: *SALMGR.BA*, the data entry and manipulation program; *SM-RPT.BA*, the report generator; *MEMMGR.BA*, a "throw-in" memory manager program; and *DATMGR.BA*, a fairly flexible data management facility which permits interfacing files created using *TSM* to other Traveling Software programs. This review focuses on the first two programs, but don't overlook the other two: they could be quite useful to you.

TSM puts a great deal of emphasis on menus and formatted screens for ease of use. For example, if you elect to enter or update customer biographical information, you'll see a screen like that shown in Figure 1, with spaces for you to enter the Customer ID, Preparation Date, Name of contact, Company name, Street address, City, State and ZIP Code. Each data field is labeled and each has a group of dark blocks (inverse squares, technically) marking out where its contents are to be typed. If you fill up one of these areas, the computer automatically jumps to the next field in line (which causes some problems that we'll discuss below, but in principle is a sound idea). If you are through typing the name and you still have empty squares left, you must press the ENTER key to move to the next field. The computer automatically supplies the Prep Date as today's date, but you can change it if you wish.

When you finish the first screen of customer information, you are automatically given a second screen, where there is room for two phone numbers and three lines of comments which can contain any data you wish.

Besides basic customer data, you can also keep track of follow-up requirements in a Customer Log. This log allows you to post the next date you should contact a customer, whether any action is required, and a reminder about the action to be taken. You may also optionally have any contact flagged so that when you ask the program to "View Pending Customer Contacts" it will

show you all your pending actions.

A traveling salesman's job is to take orders and *TSM* would be less than useful if it didn't let you do this task. It supports this need quite well. All you have to do is enter the order date (which the computer fills in as today's date but allows you to overrule), and the customer ID. If that ID is in your file, the Model 100 will show you the customer's name; otherwise, it will wait for you to identify the customer by name. Then you tell the system the product code for the item being ordered, the number of units, the unit of measure (EA for each, GAL for gallons, etc.; all of your own choosing), the unit price and the terms. The computer calculates the tax (using a figure you can adjust in another file) and extends the total.

TSM is also set up automatically to delete information which has been on file longer than you find useful, which is a particularly considerate design feature on a memory-limited computer. The system lets you define how many days you'd like to keep log information and orders on file. It then deletes those items when they have passed their useful point.

When it comes to reports, *TSM* offers you a limited range, but perhaps enough to accomplish what a "typical" salesperson might need. You can get a Customer Log Report which prints out all of the follow-up actions needed by customers, in date order. You can also get a Customer Biography report which gives names, addresses, phone numbers, notes and Customer ID, sorted in Customer ID order. The other two reports available are an Order Log sorted by Customer and an Order Log sorted by Product. In fairness, if you used the *Traveling Data Manager* "freebie" that comes on the tape and a text formatting program like *Traveling Writer*, *WRITE+* or your favorite, you could sort and format reports differently from those coded in the program.

The programs loaded the first time with no difficulty. There's only one program file to load each time; *Traveling Software* creates machine language routines within the program in what they claim is a "proprietary" way which eliminates the necessity of also loading a machine language file from the tape.

All in all, I suspect you'd agree, a program which is worthwhile. Whether

it's worth the \$59.95 asking price or not is something you'd have to determine based on how you now handle sales activities on the road. But before you make that decision, you ought to know about some of the things I found to be less convenient in the program.

One problem I encountered was the fact that the program apparently did not allow enough string capacity to handle even two records which had used all of the approximately 243 bytes occupied by a filled-up entry. I consistently got an OM (memory) error until I called *Traveling Software*. They were quite helpful and let me talk to the programmer, who suggested a change in Line 16 of the code to expand the amount of string space being allocated. The point, of course, is that you shouldn't have to make that call and a program modification.

As I mentioned earlier, the program's design forces the cursor to jump from one field to the next when you fill up any field. That, coupled with the fact that an ENTER in a field leaves it empty, can have some undesirable results. For example, the two-character State code on the Customer Biography will *always* fill

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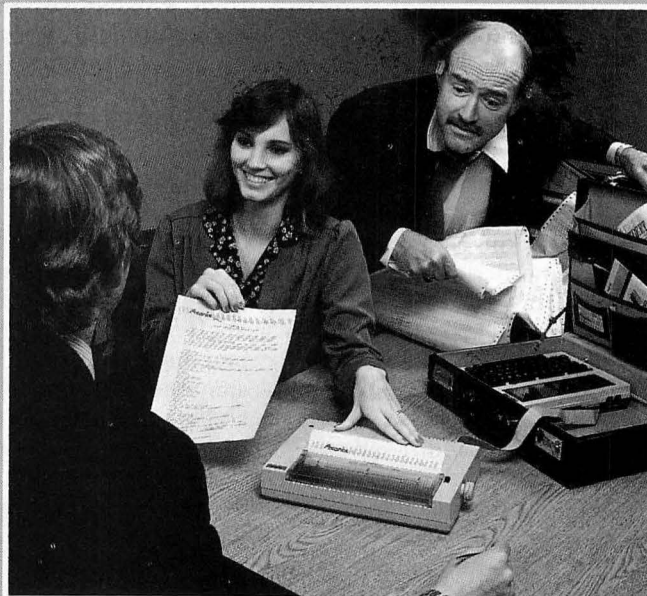
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up. Yet when I got into a rhythm of entering data, I inevitably pressed the ENTER key at the end of that field, resulting in the ZIP Code field being skipped. Easy enough to fix (just go back to that screen and re-position the cursor and enter the ZIP Code), but annoying nonetheless. A similar but more serious problem arises when you fill up a data field when you're not looking at the screen. If the contact name takes up more than the space allocated, the cursor continues on its merry way to the next line and puts the rest of the person's name into the first part of the Company field. The same thing happens, with more disastrous consequences, if you fill up the third line of the Notes section in the same program; in that case, the excess input wraps back to the first screen and begins to change the customer ID on which the whole system is based. Could get quite nasty trying to figure out what you'd done there!

For some reason, the way the program is written, data entry is slowed unnecessarily. I found myself often waiting for the cursor to catch up and on more than one occasion I lost a great many characters in my input stream. I am a very fast typist and quite accurate, and that may make me an exception on this point, but don't assume (as one can with the TRS-80 Model 100 *TEXT* program) that the program is keeping up with your entries if there are relatively long (several second) pauses. This is a relatively serious design flaw from my perspective; if you're a relatively slow typist, it may not be a problem.

Another "problem" not covered in the documentation arises if you enter part of a line (say, the second line of the Notes section on the Customer Biography run) and decide to SAVE the record to memory at that point. Pressing Function key F1 at that point without first pressing ENTER results in that last line being lost. I learned the hard way that the same principle applies to editing within the file as well. Again, this seems to me to be a pretty serious shortcoming of the program, and one which would have been fairly easy to avoid.

I found it cumbersome to switch back and forth between *SALMGR* and *SM-RPT* because the former won't run on my fully-loaded 32K unit with *SM-RPT* in memory at the same time. I have over 10.5K free when I finish loading *SALMGR*, but when I load only eight "typi-

cal" entries into my customer file and a very small number of orders and log reminders, I find myself with about 9K left. That should be plenty, but *SM-RPT* takes nearly 7K, so when you try to run *SALMGR*, you get a memory error early on.

One final minor point worth mentioning is that if you use the built-in FIND function (key F3 in the program) and then enter a non-existent customer ID code, the computer "finds" the next one in sequence after where the one you asked for would have been if it had been there in proper order. That may be all right, but I personally would have preferred a "NOT FOUND" message. As it is, I have to press F7 for a new screen and re-enter the Customer ID I'm really looking for; an unnecessarily slow process.

There were other, far more minor design changes I personally would have made if I'd programmed the *Traveling Sales Manager*. But on the whole, if you are on the road a lot and need the convenience of a portable customer file manager and order taker, this program might be just what the boss ordered.

(Traveling Software, 11050 Fifth Avenue NE, Seattle, WA 98125, \$59.95)

— Dan Shafer

New Products

PocketInfo's *LapLog* Enhances *TELCOM* Function

LapLog is a program from Pocket-Info Corp. which allows the Model 100 user to scroll through all data sent or received during an online, interactive communication session with a host computer. The user can review the data during information transmission or reception, a feature similar to multiple screen pages on larger systems. The amount of data that can be reviewed is limited only by the Model 100's memory capacity.

LapLog is an enhancement to the Model 100's *TELCOM* communications software.

Ghost control characters transmitted during communications sessions are invisible to users, and can cause communications difficulties. *LapLog*'s Snoopy mode displays the ASCII number of each control character in reverse video as it's received, helping users troubleshoot the source of communications problems.

LapLog's scrolling and Snoopy capabilities can be invoked simply by pressing the appropriate function key.

It's available on tape cassette for \$39.95.

For further information, contact PocketInfo Corp., P.O. Box 152, Beaverton, OR 97075 (503) 649-8145.

Portable Computer Message System

Software Riches has announced the operation of a new bulletin board information service exclusively for Portable Computer users. The Portable Computer Message System (PCMS) will be online 24 hours a day, seven days a week, allowing users to send electronic mail to other users, post public messages, trade operating tips, and obtain information about new software and peripherals for Portable Computers. Technical assistance and public domain software donated by other members are also available on PCMS.

By sending \$15, along with your name, address, phone number and computer model, you will receive a personal password, access phone number, and PCMS User's Guide. There is no charge for online connect time.

For more information, contact Software Riches, Riverview Terrace, Irvington, NY 10533; phone (914) 591-6470.

New Low-Cost Model 100 Software

Three new low-cost programs for the Model 100 have been introduced by Chattanooga Systems Associates: *Autopen*, a word processing program; *Book*,

(continued on Page 54)

BASIC in Bar Code

Bar coded BASIC programs for the Model 100 can save hours of typing and correcting tedious program listings. Here's a refresher for those who are now familiar with how this works and/or do not have the necessary PCM Bar Code Decoder program.

You'll need a bar code wand and *B3OF9.CO* tape, the BASIC program

listed here, and this copy of your favorite magazine.

Load *B3OF9.CO* from the cassette tape provided with your bar code wand following the instructions provided with the tape. Now, carefully type this program into your Model 100 and save it as "BAREAD."

It's really very simple to use. When it's RUN, the program will ask you to

scan the first line of code (suggestions for successful bar code reading follow). The program name will be displayed on the screen and you will be asked to scan the second line. If you lose your place, a quick glance at the screen will get you back on track. *BAREAD* will make a "beep" sound after a successful scan and a "blip-bloop" sound if you scan the wrong line.

```

10 MAXFILES=2
30 RUNM"B3OF9"
100 CLS
110 PRINT STRING$(40,"-");
120 PRINT "      PCM Bar Code Program De
coder"
130 PRINT STRING$(40,"-")
140 OPEN "WAND:" FOR INPUT AS 1
150 PRINT@212,"Scan First Line"
160 INPUT#1,S$:GOSUB 1000
170 IF LEFT$(D$,3)<>"001" THEN ER%=1:GOS
UB 3000:GOTO 160
180 FS$=MID$(D$,4,6)
190 OPEN FS$ FOR OUTPUT AS 2
195 PRINT@212,STRING$(15,32);
200 PRINT@132,"Reading: "+FS$
210 LC%=1:PL$="":D$="001"+RIGHT$(D$,LEN(
D$)-9):GOTO 2070
1000 ' *** DECODE STRING ***
1010 D$=""
1020 FOR I=1 TO LEN(S$)
1030   SS$=MID$(S$,I,1)
1040   IF SS$<>"$" THEN 1100
1050   SS$=MID$(S$,I+1,1)
1060   SS$=CHR$(ASC(SS$)+32)
1070   I=I+1
1080   GOTO 1200
1100   IF SS$<>"%" THEN 1200
1110   SS$=MID$(S$,I+1,2)
1120   SS$=CHR$(VAL(SS$))
1130   I=I+2
1200   D$=D$+SS$
1220 NEXT I

```

```

1230 RETURN
2000 '*** READ BAR CODE ***
2010 PL$=""
2020 INPUT#1,S$:GOSUB 1000
2030 L%=VAL(LEFT$(D$,3))
2040 IF L%-LC%>1 THEN ER%=2:GOSUB 3000:G
OTO 2020
2050 IF L%-LC%<1 THEN ER%=3:GOSUB 3000:G
OTO 2020
2060 LC%=L%
2070/ PRINT@280,STRING$(39,32);
2080 PRINT@212,"Scan line ";LC%+1;
2090 FOR I=4 TO LEN(D$)
2100   C$=MID$(D$,I,1)
2110   IF C$=CHR$(13) AND RIGHT$(PL$,5)
="DONE" THEN 2160
2120   IF C$=CHR$(13) THEN PRINT#2,PL$:
PL$="":GOTO 2140
2130   PL$=PL$+C$
2140 NEXT I
2150 GOTO 2020
2160 CLS:CLOSE:CALL 61807:MENU
3000 '*** ERROR CODES ***
3010 SOUND 5000,10:SOUND 8000,10:SOUND 5
000,10
3020 IF ER%=1 THEN ER$="You must scan li
ne 1 first!"
3030 IF ER%=2 THEN ER$="You've SKIPPED a
line!"
3040 IF ER%=3 THEN ER$="You've ALREADY S
CANNED this line!"
3050 PRINT@280,STRING$(39,32);
3060 PRINT@280+(20-.5*LEN(ER$)),ER$;
3070 RETURN

```

Before scanning any of the bar code listings contained in this section into your Model 100's memory, please be sure to carefully read the information on this page.

Tips for Successful Bar Code Reading

We are constantly working to improve the quality of the reproduction of PCM Bar Code; however, some of you may experience problems due to minor flaws in the bar code. As you become more accustomed to using the bar code wand, most of your problems will disappear. The following tips should help you become a successful bar code reader.

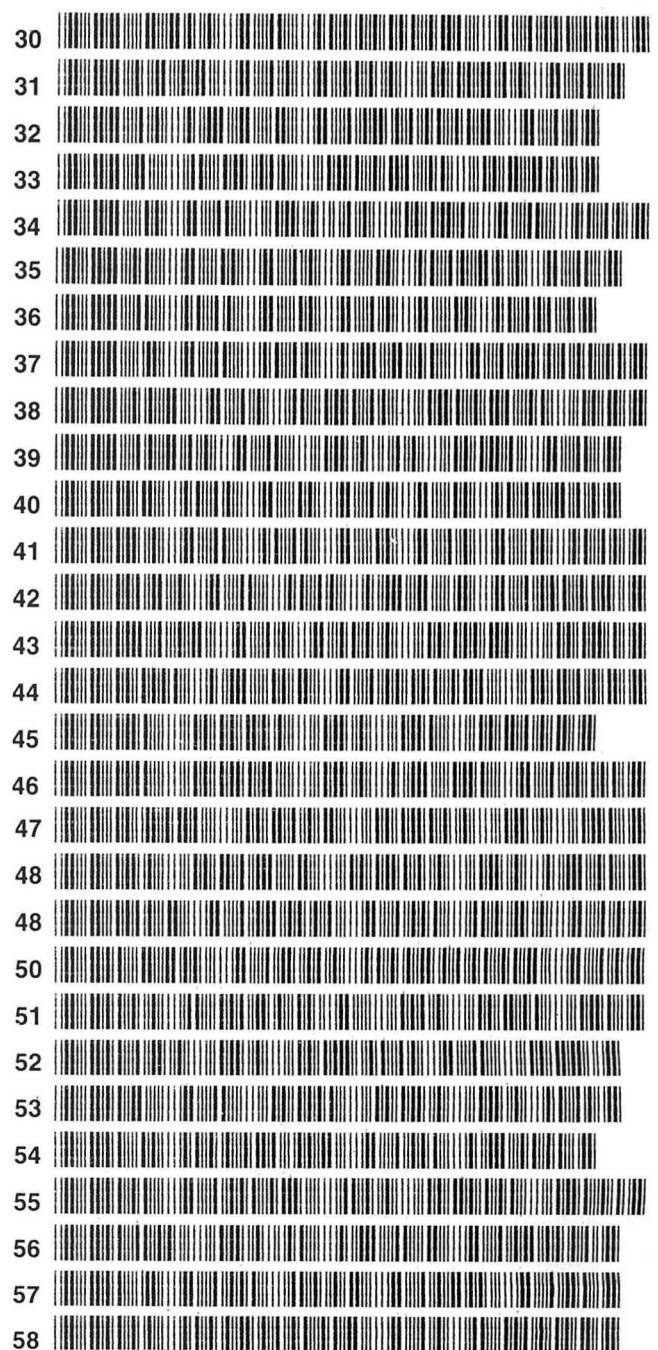
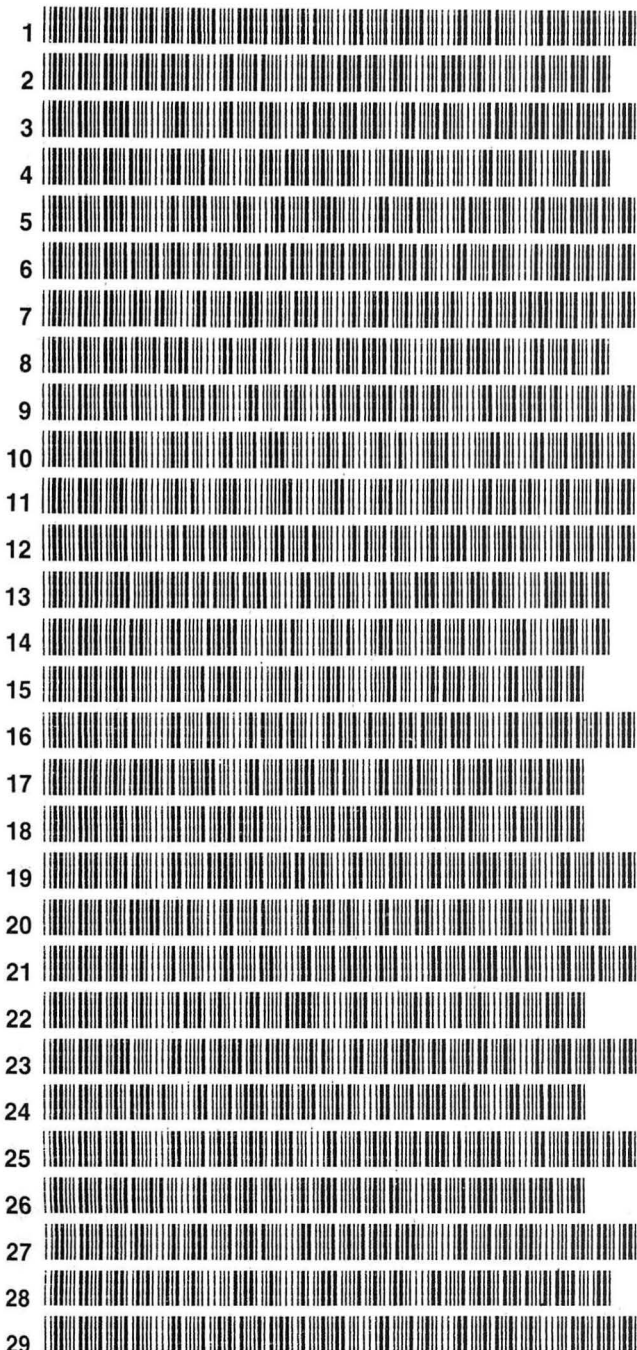
- Use an even, smooth speed.

- Keep a constant angle to the code (slightly less than 90°).
- Use your arm to move the wand — not your wrist.
- Use a straightedge such as a plastic ruler or an index card to guide your wand evenly across the code. A metal edge could damage your wand.
- If you experience problems scanning a line, move your straightedge slightly up or down and try reading a different part of the code — there may be

flaws in the printing on the spot you're trying to read.

- Use a back-and-forth motion when a line does not read in on the first try.
- Make sure that the tip of your bar code reader is free of dust.
- Keep the LED on your bar code wand clean.
- Use a piece of non-reflective plastic, such as the one provided with your bar code wand, to protect the code from scratches.

BARGRP (FROM PAGE 10)



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BARGR3 (FROM PAGE 11)

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MATH (FROM PAGE 32)

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ALASKA		Scottsburg	Radio Shack of Scottsburg	Fargo	Computer Associates
Fairbanks	Fairbanks News Agency	IOWA		OHIO	
ARIZONA		Ames	Myers TV & Stereo Repair	Cincinnati	Cinsoft
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Scottsdale	Software Land Corp.	KANSAS		PENNSYLVANIA	
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Tallahassee	Anderson News Co.	Petersborough	WBR Electronics-Radio Shack	Appleton	Badger Periodicals
GEORGIA		West Lebanon	Verham News Corp.	CANADA:	
Atlanta	Guild News Agency	NEW JERSEY		ALBERTA	
Columbus	Muscogee News Co.	Hackensack	Total Circulation Service	Calgary	Rainbow Software Services
Trenton	The Phone Line	Marmora	Outpost Radio Shack	Edmonton	Kelly's Software Distributors
ILLINOIS		Pennsville	Dave's Electronic Radio Shack	NOVA SCOTIA	
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Chicago	Prairie News Agency				
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a bookkeeping system; and *Trip*, an expense account and trip report log program.

Autopen provides formatting capabilities for the Model 100's built-in *TEXT* program while using only 2.5K of RAM. It features menu control, automatic paging and numbering, use of continuous forms or single sheets, and allows for multiple copies with personalized input. The text can be formatted in either pica, elite or micro fonts.

Book is a single entry bookkeeping system for small businesses, professionals, and the self-employed. It is based on the system of accounts required for Schedule C of the Federal Income Tax Form 1040 to report income, expenses, deductions and profits. The program supports 52 accounts, including expanded travel and entertainment records, and features full menu control and maintains a complete financial status summary.

Last in this software trio is *Trip*, a program for keeping detailed expense

account records of business and recreational trips. *Trip* features menu control, prompting messages and single key selection. It also has a note format that is suitable for keeping appointments and trip reports.

For more information about any of these products, contact Chattanooga Systems Associates, P.O. Box 22261, Chattanooga, TN 37422; phone (615) 892-2339.

dBASE II Now Available At Radio Shack

Ashton-Tate's dBASE II is now available for the Model 2000 through Radio Shack stores nationwide. This popular database program is used to create, store, edit, retrieve and manipulate information. It is suitable for virtually any business, generating reports relating to

accounts receivable, accounts payable, inventory, personnel, customers, payroll and mailing lists.

dBASE II contains an application development language that allows the user to develop specialized applications to meet their specific needs. It offers many of the programming capabilities of high level languages and enables the user to write programs faster and with fewer lines of code.

dBASE II requires either two 720K floppy disks or a 10-megabyte hard disk and one floppy, along with 256K of RAM. It is available at all Radio Shack Computer Centers and participating dealers for \$595.

CORRECTION

A mistake has been noticed in the "Flag of the Month Club" article in the June '84 issue. To print the flag on a CGP-220 Ink Jet Printer, you should change the first line to 1000 SP=1, not 1000 SP=0 as the text specified.

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